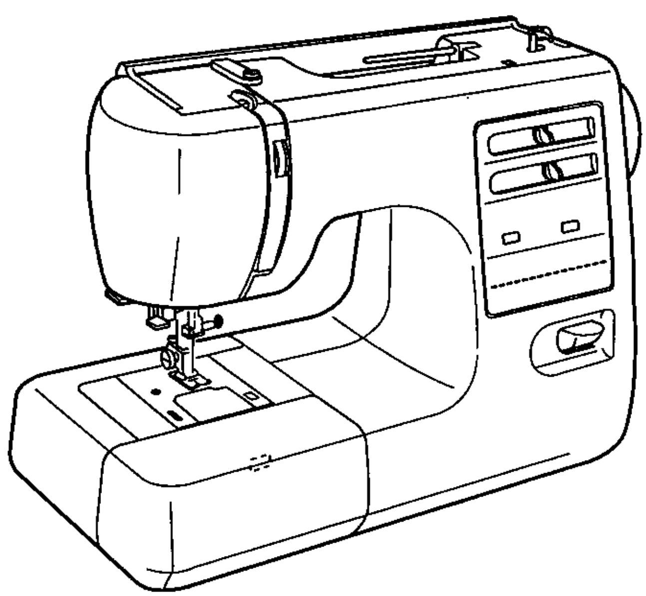
SERVICE MANUAL



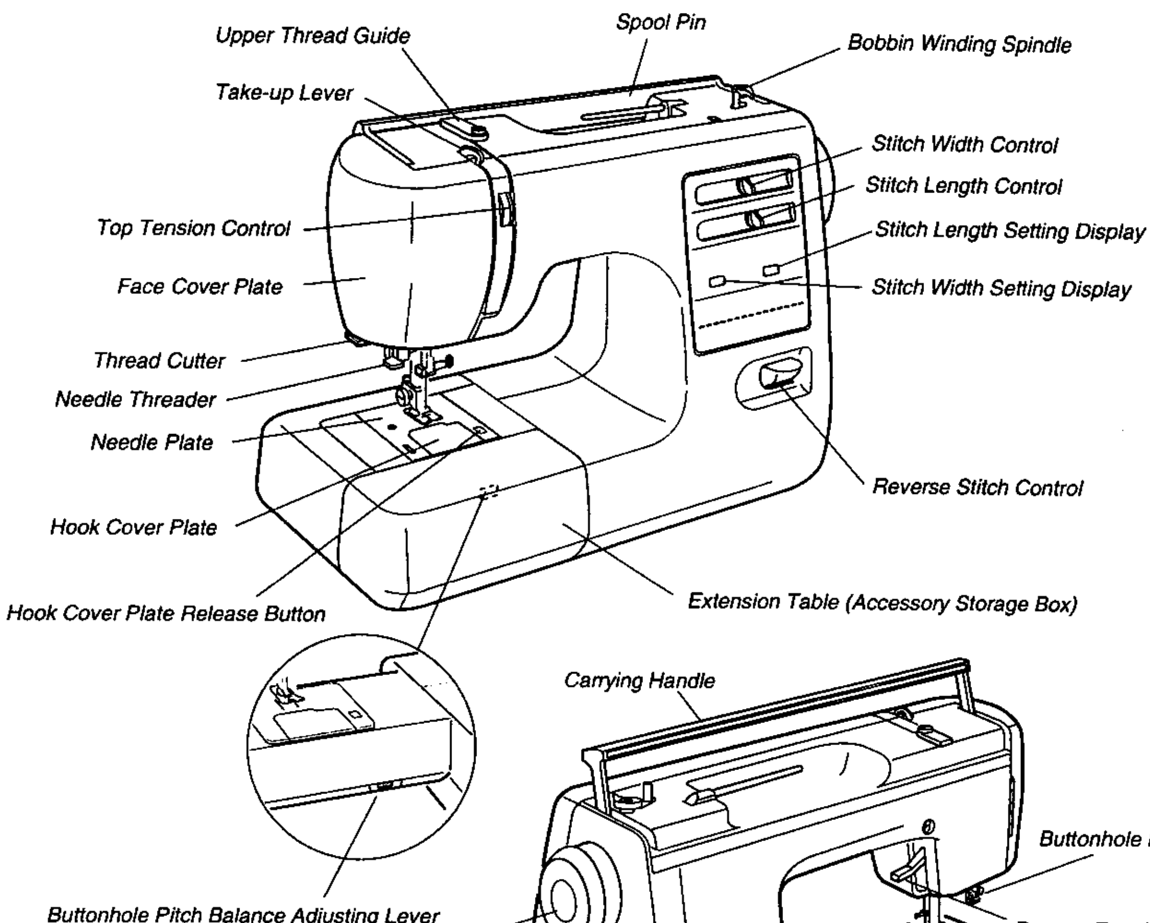
SEWING MACHINE MODEL

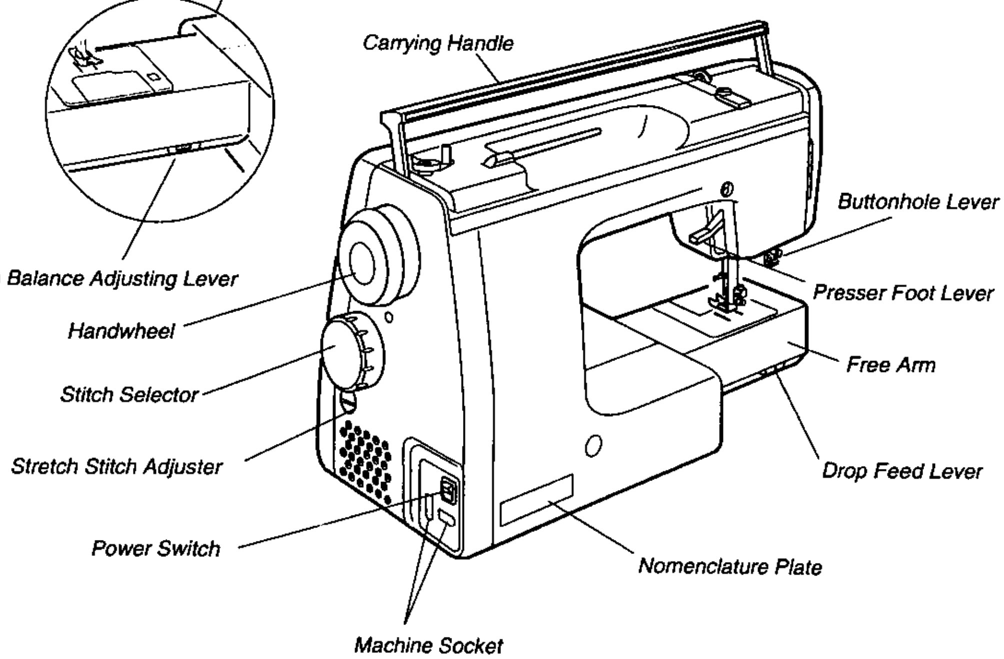
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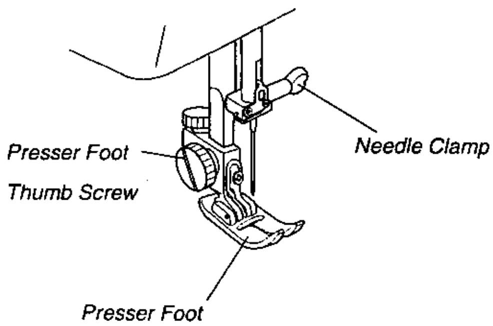
JULY, 2003

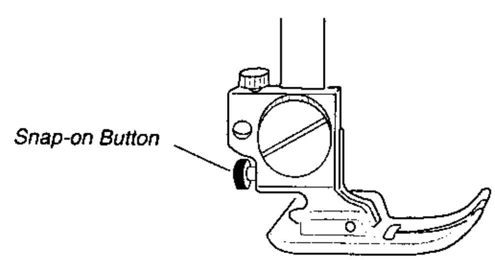
CONTENTS

LOCATE AND IDENTIFY THE PARTS









WHAT TO DO WHEN

CONDITION	CAUSE	HOW TO FIX	REFERENCE
1. SKIPPING STITCHES	1. NEEDLE IS NOT INSERTED PROPERLY.	INSERT THE NEEDLE PROPERLY.	
	2. NEEDLE IS BENT OR WORN.	CHANGE THE NEEDLE.	
	3. INCORRECTLY THREADED	RETHREAD.	
	4. NEEDLE OR THREAD ARE INAPPROPRIATE FOR FABRIC BEING SEWN.	USE THE RECOMMENDED SEWING NEEDLE AND THREAD.	
	5. SEWING ON STRETCH FABRIC	USE A #11 BLUE TIP NEEDLE.	
	6. PRESSER FOOT PRESSURE IS TOO WEAK.	ADJUST THE PRESSER BAR LEVEL TO MAKE THE PRESSURE STRONGER.	
	7. INAPPROPRIATE NEEDLE BAR HEIGHT	SEE MECHANICAL ADJUSTMENT "NEEDLE BAR HEIGHT".	P.22, 23
	8. INAPPROPRIATE NEEDLE TO SHUTTLE TIMING	SEE MECHANICAL ADJUSTMENT "NEEDLE TO SHUTTLE TIMING".	P.24, 25
	9. INAPPROPRIATE NEEDLE TO SHUTTLE CLEARANCE	SEE MECHANICAL ADJUSTMENT "NEEDLE CLEARANCE TO SHUTTLE."	P.26
2. FABRIC NOT MOVING	1. PRESSER FOOT PRESSURE IS TOO WEAK.	ADJUST THE PRESSER BAR LEVEL TO MAKE THE PRESSURE STRONGER.	
	2. INCORRECT F.D. HEIGHT	SEE MECHANICAL ADJUSTMENT "FEED DOG HEIGHT."	P.20, 21
	3. F.D. IS IN DOWN POSITION.	RAISE THE F.D. LEVEL.	
	4. THREAD ON BOTTOM SIDE OF FABRIC IS JAMMED UP.	MAKE SURE TO BRING BOTH NEEDLE AND BOBBIN THREAD UNDER THE FOOT WHEN STARTING SEWING.	
	5. FEED DOG TEETH ARE WORN.	CHANGE THE FEED DOG.	

CONDITION	CAUSE	HOW TO FIX	REFERENCE
3. BREAKING UPPER THREAD	1. INITIAL SEWING SPEED IS TOO FAST.	START WITH MEDIUM SPEED.	
	2. THREAD PATH IS INCORRECT.	USE THE PROPER THREAD PATH.	
	3. NEEDLE IS BENT OR DULL.	REPLACE WITH A NEW NEEDLE.	
	4. UPPER THREAD TENSION IS TOO STRONG.	ADJUST UPPER THREAD TENSION CORRECTLY.	
	5. NEEDLE SIZE IS INAPPROPRIATE FOR FABRIC.	USE APPROPRIATE NEEDLE FOR FABRIC AND THREAD IN USE.	
	6. NEEDLE EYE IS WORN.	CHANGE THE NEEDLE.	
	7. NEEDLE HOLE IN NEEDLE PLATE IS WORN OR BURRED.	REPAIR THE HOLE OR REPLACE THE NEEDLE PLATE.	
4. BREAKING BOBBIN THREAD	1. INCORRECTLY THREADED BOBBIN.	THREAD BOBBIN CORRECTLY.	
	2. TOO MUCH THREAD IS ON THE BOBBIN.	ADJUST THE POSITION OF STOPPER.	
	3. LINT IS STUCK INSIDE THE BOBBIN HOLDER.	CLEAN THE SHUTTLE.	
	4. THREAD QUALITY IS TOO LOW.	CHANGE TO A HIGHER QUALITY SEWING THREAD.	
	5. THREAD IS JAMMING AROUND THE BOBBIN.	CLEAR OUT THE JAMMING THREAD.	
5. NEEDLE BREAKS	1. NEEDLE IS HITTING THE NEEDLE PLATE.	SEE MECHANICAL ADJUSTMENT "NEEDLE POSITION."	P.30 , 31
	2. NEEDLE IS BENT OR WORN.	CHANGE THE NEEDLE.	
	3. NEEDLE IS HITTING THE SHUTTLE.	SEE MECHANICAL ADJUSTMENT "NEEDLE CLEARANCE TO SHUTTLE."	P.26
	4. THE FABRIC MOVES WHILE THE NEEDLE IS PIERCING IT, OR THE NEEDLE ZIGZAGS WHILE IN FABRIC.	SEE MECHANICAL ADJUSTMENT "NEEDLE SWING."	P.13
	5. FABRIC IS BEING PULLED TOO STRONGLY WHILE SEWING.	GUIDE THE FABRIC GENTLY WHILE SEWING.	

CONDITION	CAUSE	HOW TO FIX	REFERENCE
6. NOISY OPERATION	1. BACKLASH BETWEEN SHUTTLE HOOK GEAR AND LOWER SHAFT GEAR IS TOO GREAT.	SEE MECHANICAL ADJUSTMENT "BACKLASH (LOWER SHAFT GEAR)."	P.27
	2. LOWER SHAFT GEAR IS LOOSE.	ELIMINATE THE LOOSENESS.	
	3. INAPPROPRIATE BELT TENSION.	SEE MECHANICAL ADJUSTMENT "MOTOR BELT TENSION."	P.37
	4. NOT ENOUGH OIL	OIL ALL MOVING PARTS.	
	5. UPPER SHAFT IS LOOSE.	ELIMINATE THE LOOSENESS.	
7. DEFORMATION PATTERN	1. INAPPROPRIATE FEED BALANCE.	SEE MECHANICAL ADJUSTMENT "STRETCH STITCH BALANCE."	P.18, 19
	2. INAPPROPRIATE ZIGZAG SYNCHRONIZATION.	SEE MECHANICAL ADJUSTMENT "NEEDLE SWING."	P.13
	3. UPPER THREAD TENSION IS TOO STRONG.	SEE MECHANICAL ADJUSTMENT "TOP TENSION."	
8. IMPROPER BUTTONHOLE RESULTS	1. BUTTONHOLE STITCH BALANCE IS NOT CORRECT.	SEE MECHANICAL ADJUSTMENT "BUTTONHOLE STITCH BALANCE."	P.28, 29
	2. IMPROPER SIZE ON AUTO BUTTONHOLE	SEE MECHANICAL ADJUSTMENT "BUTTONHOLE FUNCTION (1)."	P.35
	3. CHANGING TO BAR TACK IS TOO EARLY OR WILL NOT WORK.	SEE MECHANICAL ADJUSTMENT "BUTTONHOLE FUNCTION (2)."	P.36

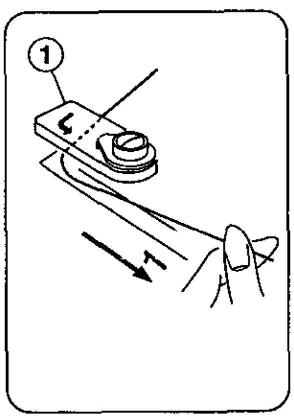
THREADING OF MACHINE

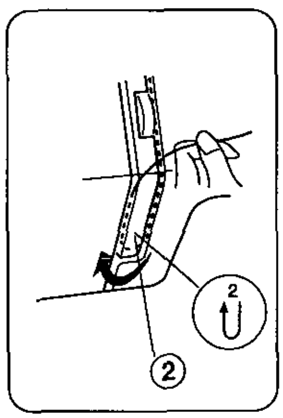
THE NUMBERED STEPS BELOW FOLLOW THE NUMBERS ON THE ILLUSTRATIONS. DOTTED LINES SHOW THE PLACES WHERE THE THREAD LOOPS AND IS THEN PULLED TIGHT.

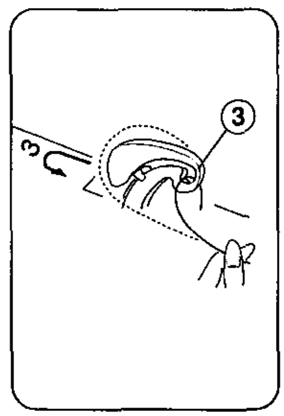
RAISE THE TAKE-UP LEVER TO ITS HIGHEST POSITION BY TURNING THE HANDWHEEL TOWARD YOU.
RAISE THE PRESSER FOOT LEVER.
PLACE THE SPOOL ON A PIN WITH THE THREAD COMING FROM THE BACK OF THE SPOOL.

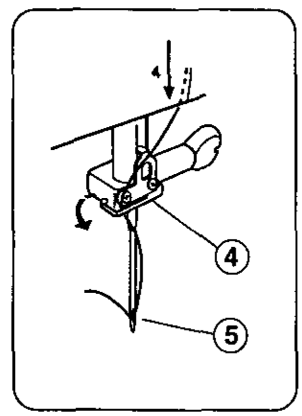
1. DRAW THE THREAD THROUGH THE THREAD GUIDE.
2. HOLDING THE THREAD TAUT WITH YOUR RIGHT HAND, DRAW THE THREAD DOWN INTO THE TENSION AREA AND THEN AROUND THE CHECK SPRING HOLDER.
3. FIRMLY DRAW THE THREAD UP AND THROUGH THE TAKE-UP LEVER FROM RIGHT TO LEFT.
4. PULL THE THREAD TO THE LEFT, AND SLIP IT INTO THE NEEDLE BAR THREAD GUIDE.
5. THREAD THE NEEDLE FROM FRONT TO BACK.

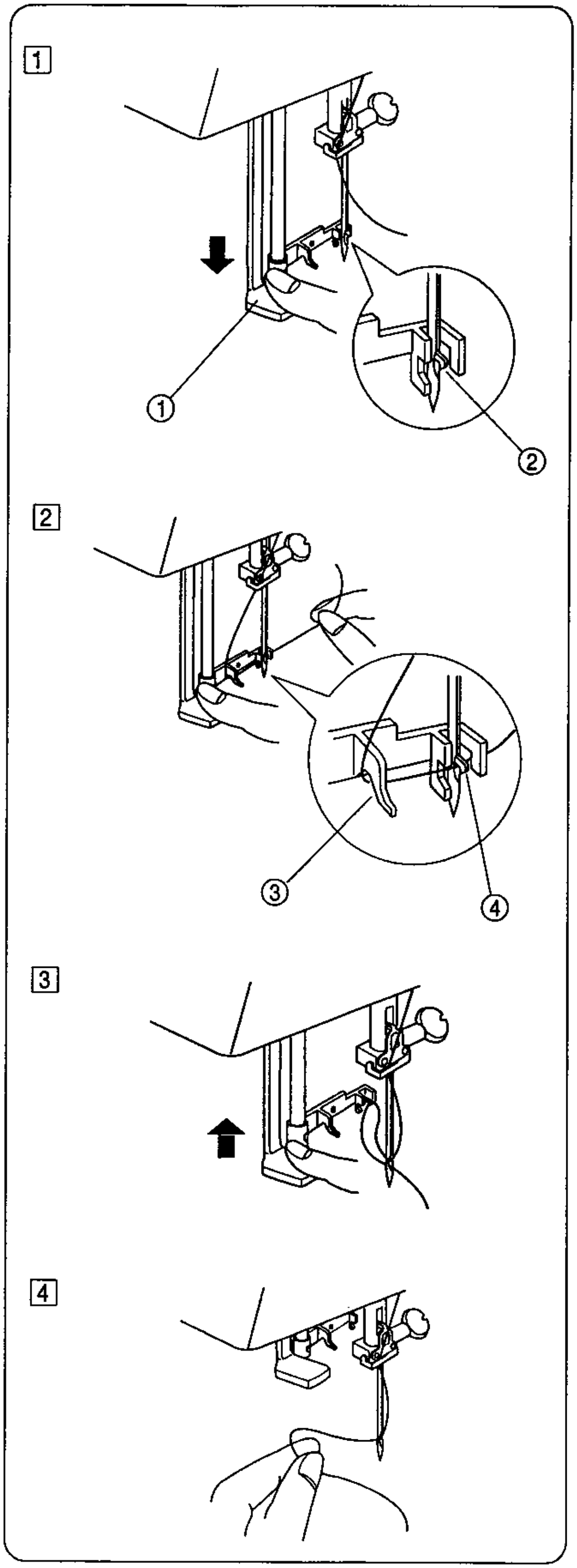
NOTE: YOU MAY WANT TO CUT THE END OF THE THREAD WITH SHARP SCISSORS FOR EASIER NEEDLE THREADING.











Automatic Needle Threader

1 Lower the presser foot. Depress the needle threader knob as far as it will go.
The hook comes out through the needle eye from behind.

① Needle threader knob
② Hook

2 Draw the thread down around the threader guide and under the hook.

③ Threader guide
④ Hook

3 Release the threader knob slowly while holding the thread end with your hand.
A loop of the thread is pulled up through the needle eye.

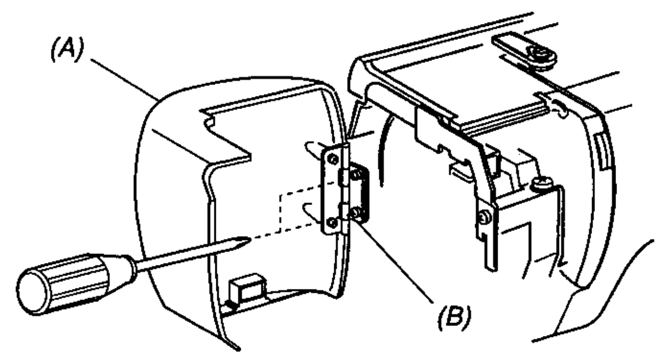
4 Remove the loop from the threader and pull out the thread end from the needle eye.

NOTE:

The automatic threader works well with the threads #50-100 and needles #11-16, the blue tipped needle as well.

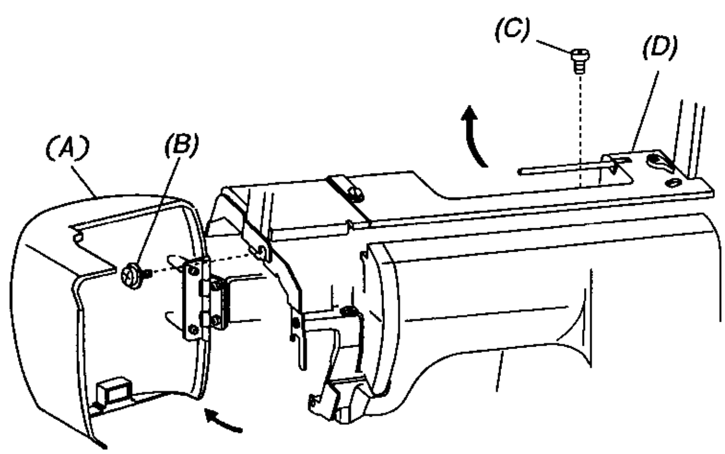
SERVICE ACCESS

FACE COVER



1. OPEN THE FACE COVER (A).
2. REMOVE THE SETSCREWS (B).
3. TAKE THE FACE COVER (A) OFF.

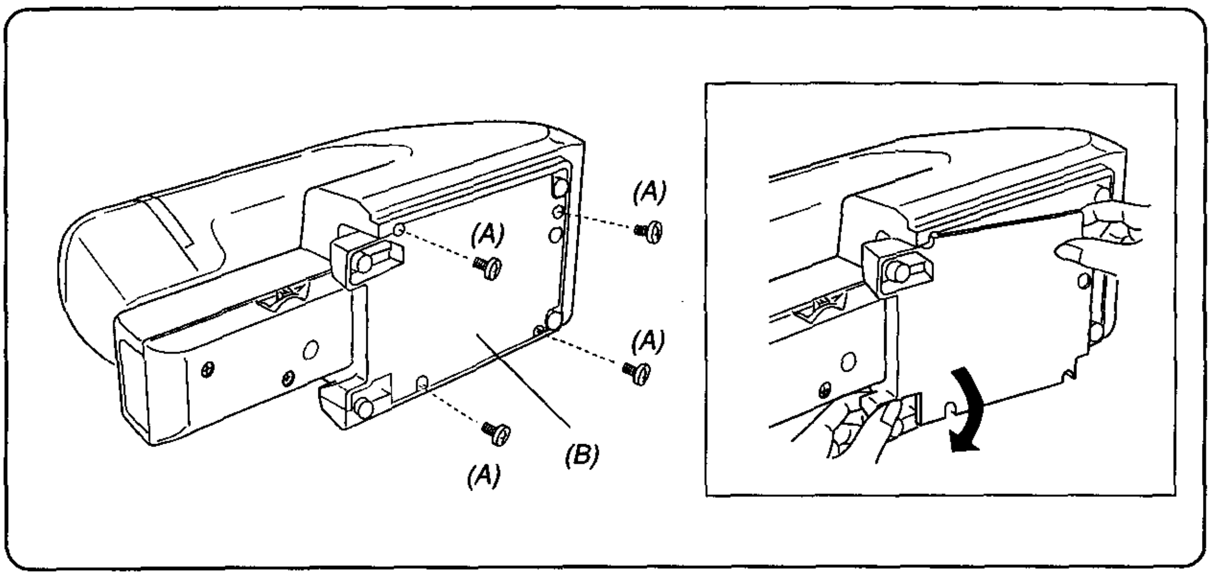
TOP COVER



1. OPEN THE FACE COVER (A).
2. REMOVE THE SETSCREWS (B) AND (C).
3. TAKE THE TOP COVER (D) OFF.

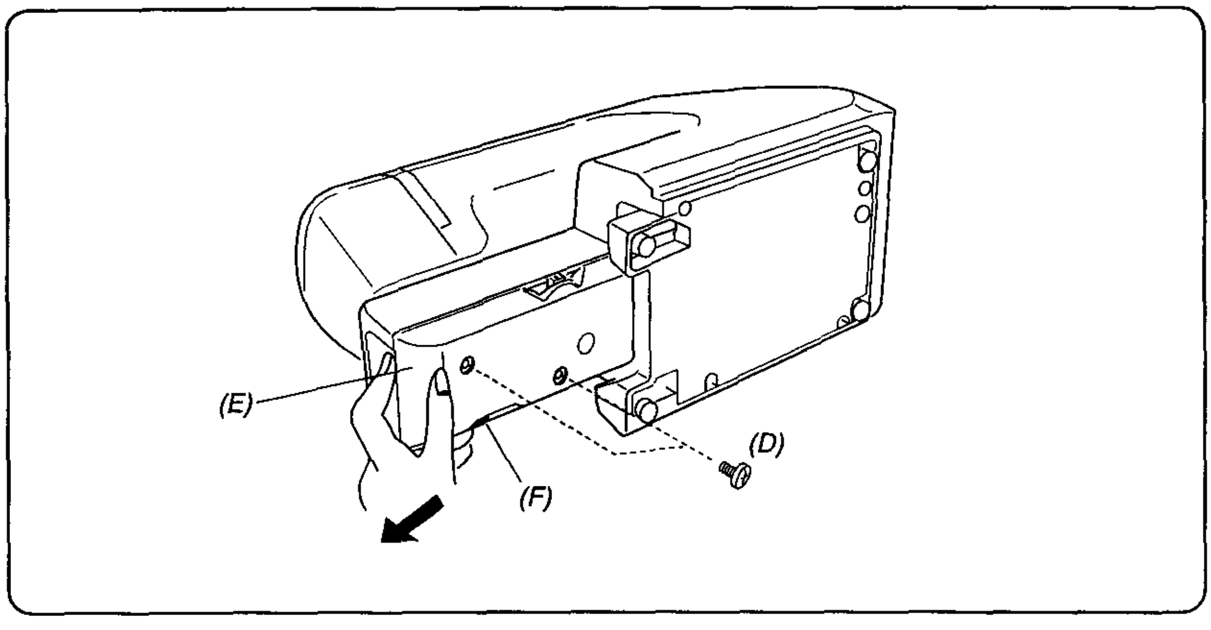
SERVICE ACCESS

BASE PLATE



1. REMOVE THE FOUR SETSCREWS (A).
2. REMOVE THE BASE PLATE (B).

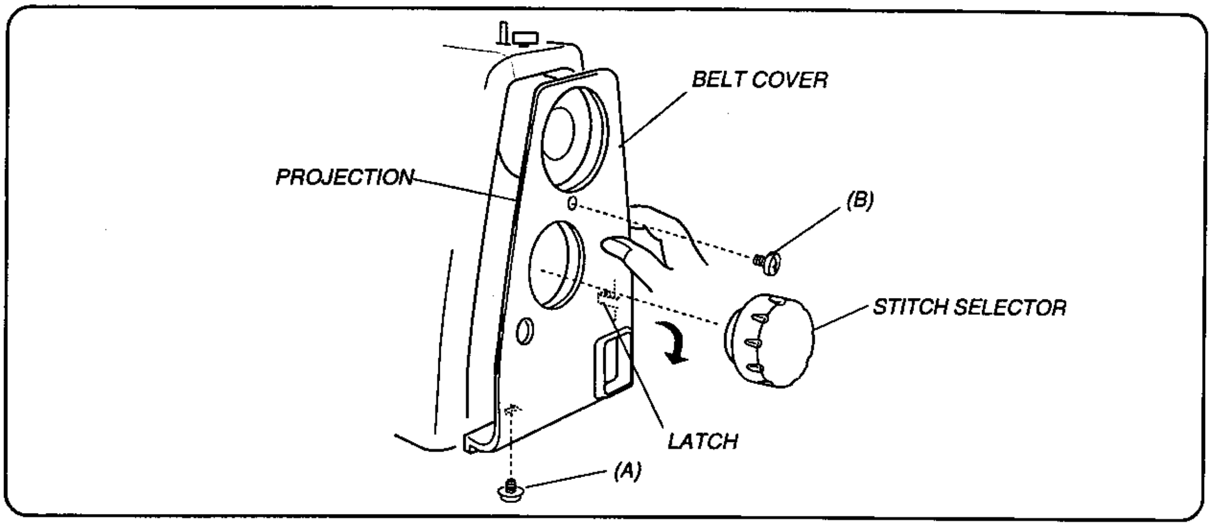
BED COVER



1. REMOVE THE TWO SETSCREWS (D).
2. REMOVE THE BED COVER (E).
   * WHEN YOU REPLACE THE BED COVER, SET THE FEED DROP LEVER (F) IN THE LEFT POSITION.

SERVICE ACCESS

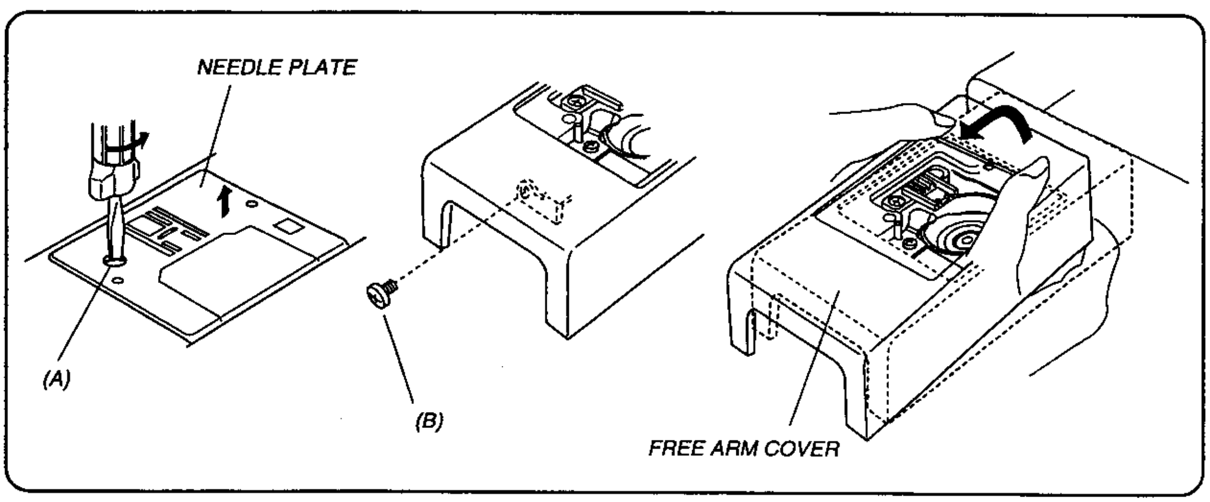
BELT COVER



PULL OUT THE STITCH SELECTOR. LOOSEN THE SETSCREW (A) AND REMOVE THE SETSCREW (B). PULL THE RIGHT SIDE OF BELT COVER IN THE DIRECTION OF THE ARROW, AS ILLUSTRATED AND TAKE THE LATCH OFF, AND THEN REMOVE THE BELT COVER.

* WHEN YOU REATTACH THE BELT COVER, SET THE PROJECTION INTO THE GROOVE ON THE FRONT COVER.

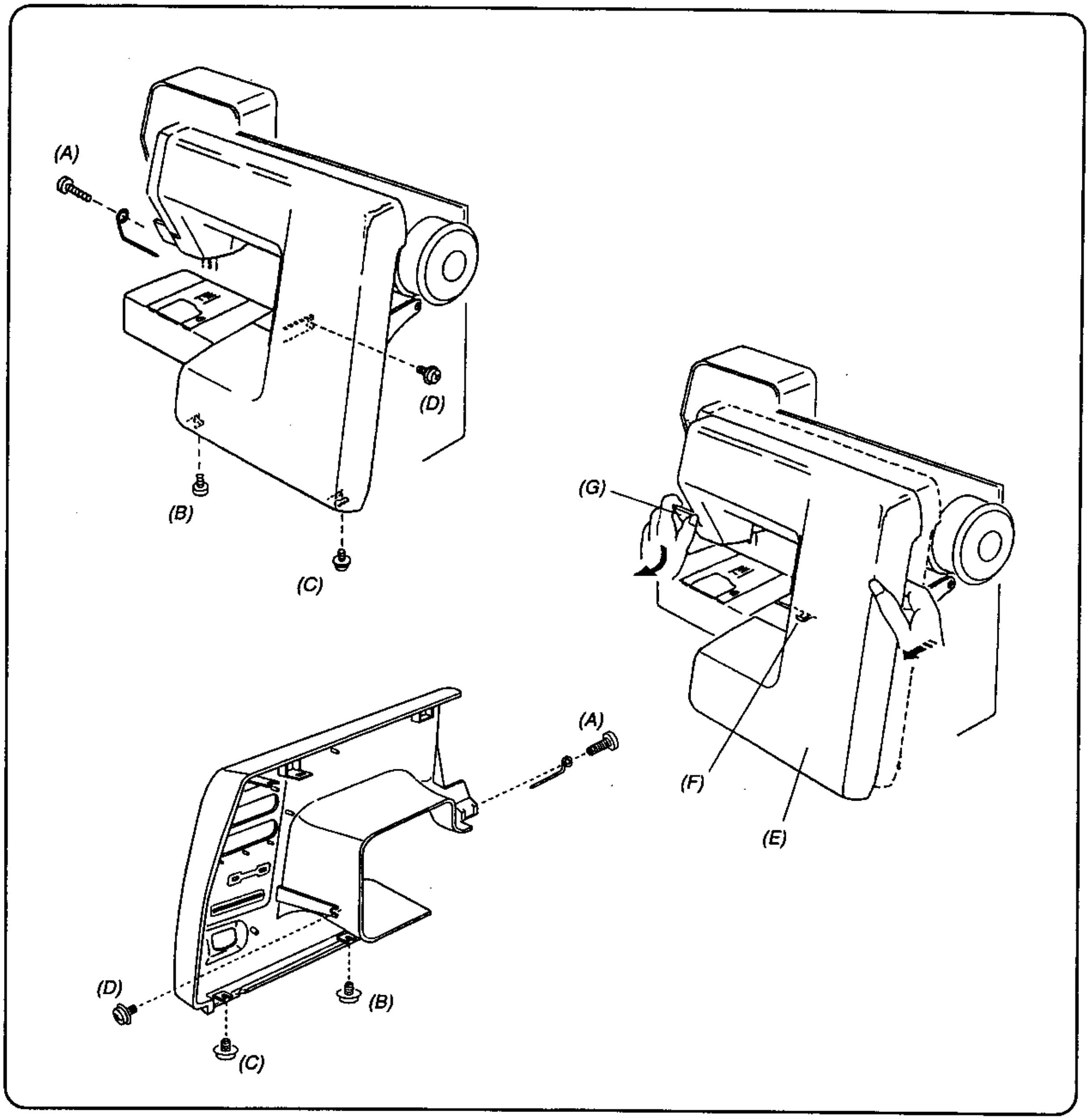
FREE ARM COVER



1. REMOVE THE SETSCREW (A) AND THE NEEDLE PLATE.
2. REMOVE THE BED COVER (SEE PAGE 7).
3. REMOVE THE SCREW (B) AND THE FREE ARM COVER.

SERVICE ACCESS

FRONT COVER

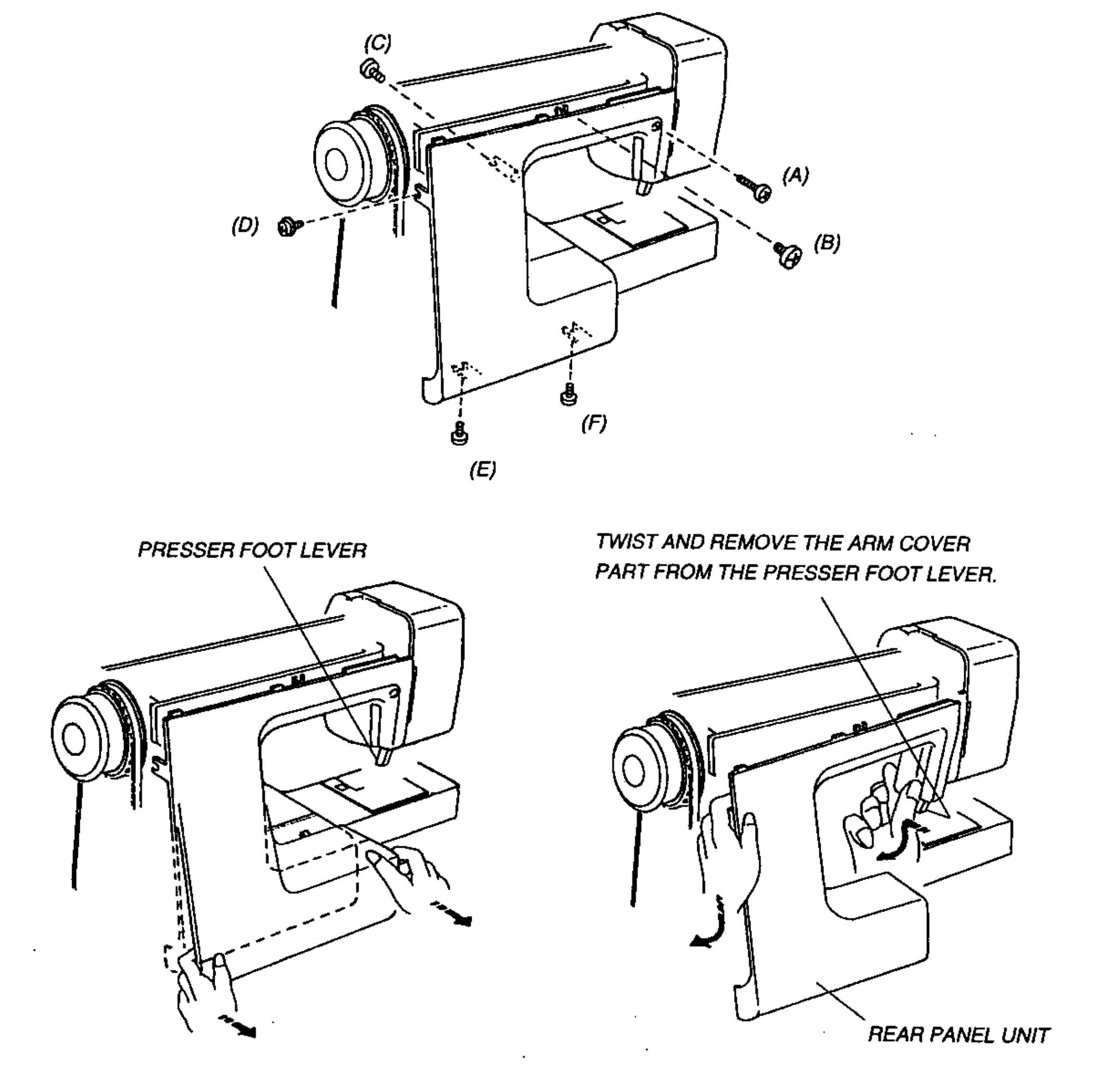


1. OPEN THE FACE COVER .
2. REMOVE THE TOP COVER (SEE P.6), AND THE BELT COVER (SEE P.8).
3. REMOVE THE SETSCREWS (A) AND (B).
4. LOOSEN SETSCREWS (C) AND (D), THEN REMOVE THE FRONT COVER (E).
5. PULL THE FRONT COVER OFF THE LATCH (F) OF THE REAR COVER.
6. REMOVE THE LOWER PART OF THE THREAD GUIDE (G).

* TO REPLACE, FOLLOW THIS PROCEDURE IN REVERSE.

SERVICE ACCESS

REAR PANEL



1. OPEN THE FACE COVER.
2. REMOVE THE TOP COVER UNIT (SEE P.6), THE BELT COVER (SEE P.8) AND THE FRONT COVER (SEE P.9).
3. REMOVE THE SETSCREWS (A) ,(B), AND (C), AND LOOSEN THE SETSCREWS (D,E AND F).
4. LOWER THE PRESSER FOOT LEVER, AND PULL AWAY THE REAR PANEL UNIT FROM THE MACHINE FRAME. TWIST AND REMOVE THE ARM COVER PART FROM THE PRESSER FOOT LEVER.

* WHEN YOU REATTACH THE REAR PANEL, PUT THE "WINDOW" ON THE PLASTIC PANEL OVER THE PRESSER FOOT LEVER, AND THEN REPLACE THE SIX SCREWS.

MECHANICAL ADJUSTMENT

TOP TENSION

TO CHECK:

1. SET THE TENSION DIAL AT "4", AND RAISE THE PRESSER FOOT.
2. PASS THE THREAD (A) BETWEEN THE DISCS, AND DRAW THE THREAD (A) DOWN AROUND THE CHECK SPRING HOLDER AS IN FIG. 1.
3. LOWER THE PRESSER FOOT, AND BRING THE THREAD (A) UP.
4. THE TOP TENSION SHOULD BE BETWEEN 75 AND 90g WHEN PULLING THE THREAD (A) UP IN THE DIRECTION OF (B).
   * USE POLYESTER SEWING THREAD #50 (WHITE).
   * IF IT IS NOT WITHIN THE ABOVE LIMITS, ADJUST AS FOLLOWS.

ADJUSTMENT PROCEDURE:

1. REMOVE THE FRONT COVER UNIT (SEE P.9).
2. PULL THE SPRING (C) AWAY FROM THE LEAD SCREW (D).
3. IF THE TOP TENSION IS TOO LOOSE, TURN THE LEAD SCREW (D) IN THE DIRECTION OF (E).
   IF THE TOP TENSION IS TOO TIGHT, TURN THE LEAD SCREW (D) IN THE DIRECTION OF (F).

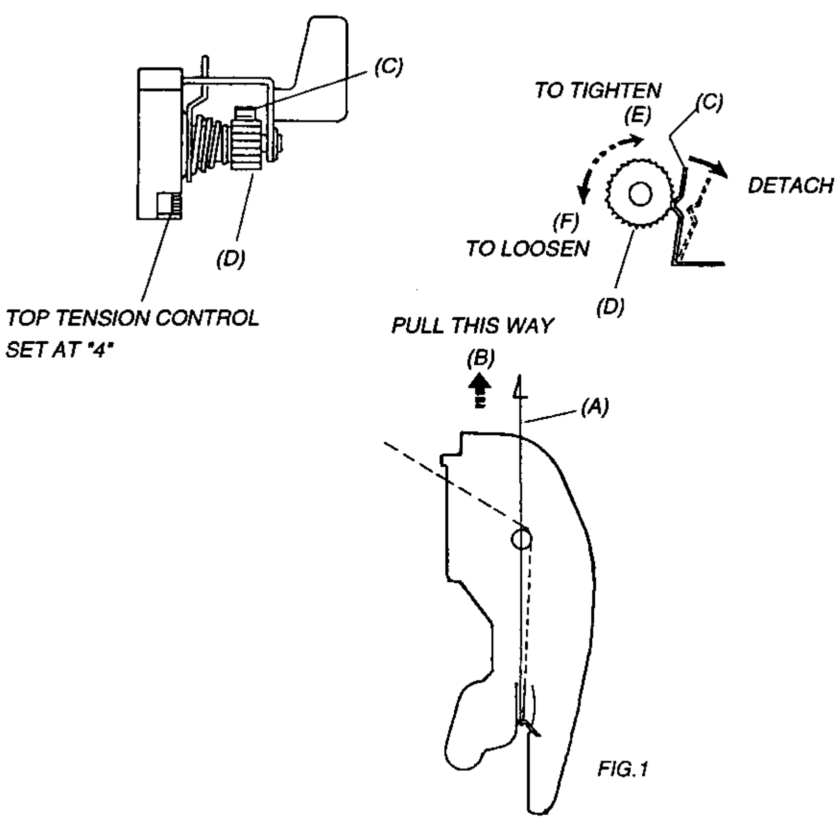


FIG.1

MECHANICAL ADJUSTMENT

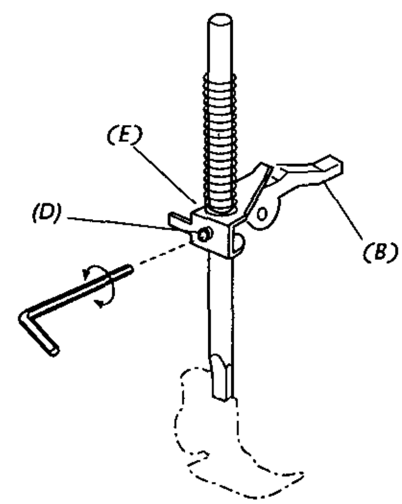
PRESSER BAR HEIGHT AND ALIGNMENT

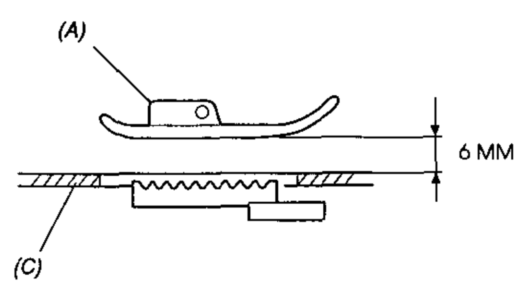
TO CHECK:

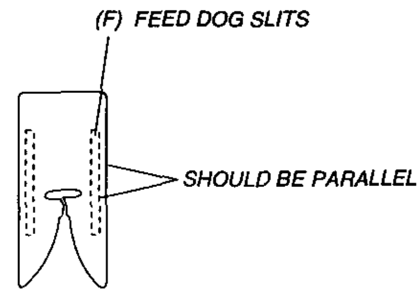
1. RAISE THE PRESSER FOOT LEVER (B).
2. THE DISTANCE BETWEEN THE ZIGZAG FOOT (A) AND THE NEEDLE PLATE (C) SHOULD BE 6.0 MM (0.24").
   * IF THIS IS NOT THE CASE, ADJUST AS FOLLOWS.

ADJUSTMENT PROCEDURE:

1. OPEN THE FACE COVER.
2. RAISE THE PRESSER FOOT LEVER (B), AND LOOSEN THE HEXAGONAL SOCKET SCREW (D) ON THE PRESSER BAR HOLDER (E).
3. ADJUST THE DISTANCE BETWEEN THE ZIGZAG FOOT (A) AND THE NEEDLE PLATE (C) TO 6.0 MM (0.24").
4. TIGHTEN THE SETSCREW (D) SECURELY.
   NOTE: WHEN YOU TIGHTEN THE SETSCREW (D), MAKE SURE THAT BOTH SIDES OF THE ZIGZAG FOOT (A) ARE PARALLEL WITH THE FEED DOG SLITS.







MECHANICAL ADJUSTMENT

NEEDLE SWING

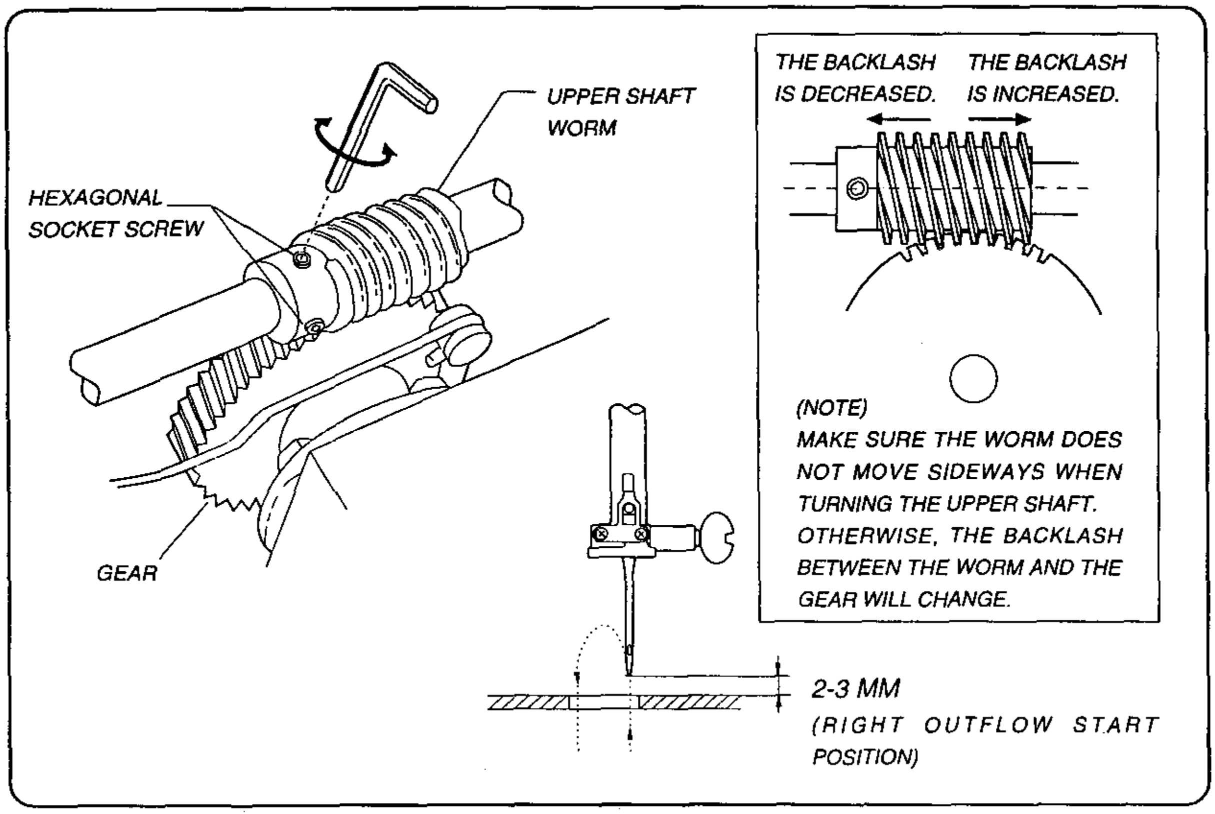
TO CHECK:

IF THE NEEDLE BAR MOVES SIDEWAYS WHILE THE NEEDLE IS IN THE FABRIC IN ZIGZAG STITCHING, ADJUST IT AS FOLLOWS:
(THE NEEDLE SHOULD START SWINGING 2 (0.08") TO 3 MM (0.12") ABOVE THE NEEDLE PLATE.)

ADJUSTMENT PROCEDURE:

1. REMOVE THE TOP COVER (SEE P.6), SET THE PATTERN SELECTOR DIAL AT " ≷ ", AND SELECT THE MAXIMUM ZIGZAG WIDTH.
2. LOOSEN THE TWO HEXAGONAL SOCKET SCREWS ON THE UPPER SHAFT WORM.
3. WHILE HOLDING THE UPPER SHAFT WORM IN PLACE, CAREFULLY TURN THE HANDWHEEL AND ADJUST IT SO THAT THE LATERAL NEEDLE SWING STARTS FROM A POSITION 2 MM (0.08") TO 3 MM (0.12") ABOVE THE NEEDLE PLATE IN RIGHT OUTFLOW.
4. TIGHTEN THE TWO HEXAGONAL SOCKET SCREWS ON THE UPPER SHAFT WORM.
5. ATTACH THE TOP COVER (UNIT).

NOTE: FOR REMOVAL AND REPLACEMENT OF THE TOP COVER (UNIT), REFER TO PAGE 2. AFTER THE TIMING ADJUSTMENT OF THE LATERAL NEEDLE SWING, MAKE SURE THAT THERE IS NO BACKLASH BETWEEN THE UPPER SHAFT WORM AND THE OTHER GEAR, AND THAT A SMOOTH ROTATION IS OBTAINED.



MECHANICAL ADJUSTMENT

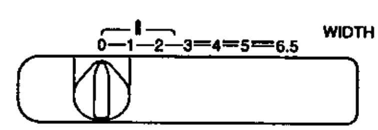
STRAIGHT STITCHING

TO CHECK:

1. SET THE STITCH WIDTH CONTROL AT " 0 ", AND THE STITCH SELECTOR AT 
2. TURN THE HANDWHEEL BY HAND.
3. THE NEEDLE SHOULD NOT SWING SIDE TO THE SIDE AT THIS SETTING.



SELECTED PATTERN



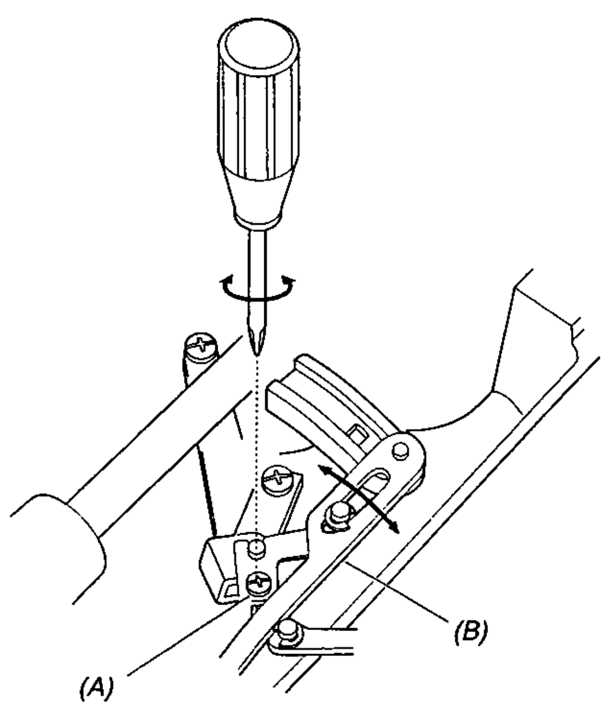
STITCH WIDTH CONTROL

MECHANICAL ADJUSTMENT

STRAIGHT STITCHING

ADJUSTMENT PROCEDURE:

1. REMOVE THE TOP COVER (SEE P.6).
2. LOOSEN SETSCREW (A).
3. MOVE THE ZIGZAG WIDTH ROD (B) UNTIL THE NEEDLE CEASES ITS ZIGZAG MOVEMENT WHEN YOU TURN THE HANDWHEEL TOWARD YOU.
4. RETIGHTEN SETSCREW (A) SECURELY.



MECHANICAL ADJUSTMENT

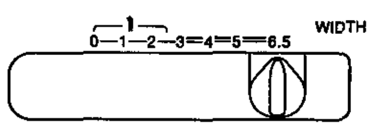
DISTRIBUTION OF NEEDLE SWING

TO CHECK:

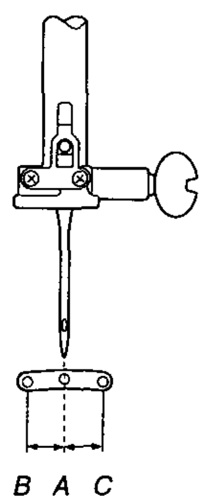
1. SET THE STITCH WIDTH CONTROL TO " 0 " AND THE STITCH SELECTOR AT .
2. RAISE THE NEEDLE TO ITS HIGHEST POSITION.
3. DROP THE FEED DOGS.
4. PLACE A PIECE OF PAPER ON THE NEEDLE PLATE, AND LOWER THE PRESSER FOOT.
5. LOWER THE NEEDLE TO MARK THE NEEDLE POINT (A) ON A PIECE OF PAPER BY TURNING THE HANDWHEEL.
6. RAISE THE NEEDLE TO ITS HIGHEST POSITION.
7. SLIDE THE STITCH WIDTH CONTROL TO 6.5.
8. LOWER THE NEEDLE TO MARK THE NEEDLE POINTS (B AND C) ON THE PIECE OF PAPER, BY TURNING THE HANDWHEEL.
9. THE DISTANCE BETWEEN A-B AND A-C SHOULD BE EQUAL.



SELECTED PATTERN



STITCH WIDTH CONTROL

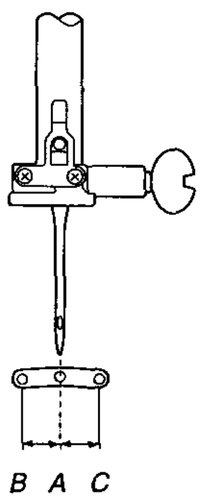


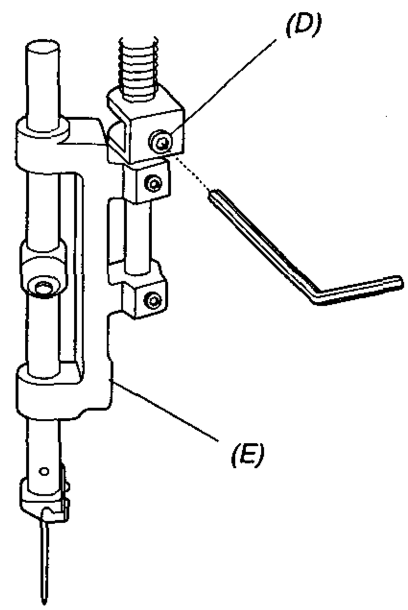
MECHANICAL ADJUSTMENT

DISTRIBUTION OF NEEDLE SWING

ADJUSTMENT PROCEDURE:

1. OPEN THE FACE COVER, AND LOOSEN THE HEXAGONAL SOCKET SCREW (D).
2. MOVE THE NEEDLE BAR SUPPORTER (E) IN EITHER DIRECTION UNTIL THE DISTANCES A TO B, AND A TO C, BECOME EQUAL.
3. TIGHTEN HEXAGONAL SOCKET SCREW (D) SECURELY.





MECHANICAL ADJUSTMENT

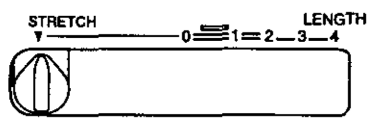
STRETCH STITCH BALANCE

TO CHECK:

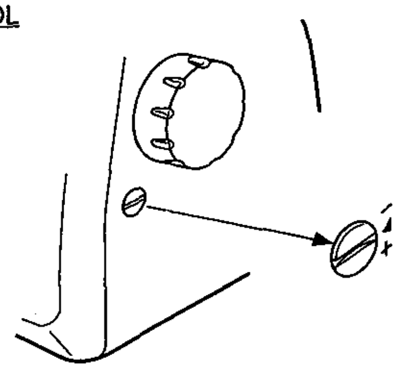
1. SET THE STITCH SELECTOR AT ⦀ , THE STITCH LENGTH CONTROL AT STRETCH STITCH, AND THE STRETCH STITCH ADJUSTER AT ◄ .
2. PLACE A PIECE OF PAPER ON THE NEEDLE PLATE AND LOWER THE PRESSER FOOT.
3. TURN THE HANDWHEEL TO MARK NEEDLE POINTS ON THE PAPER.
4. THE NEEDLE SHOULD PENETRATE THE SAME HOLE IN A FORWARD AND REVERSE DIRECTION WHILE TURNING THE HANDWHEEL TOWARDS YOU.



SELECTED PATTERN



STITCH LENGTH CONTROL



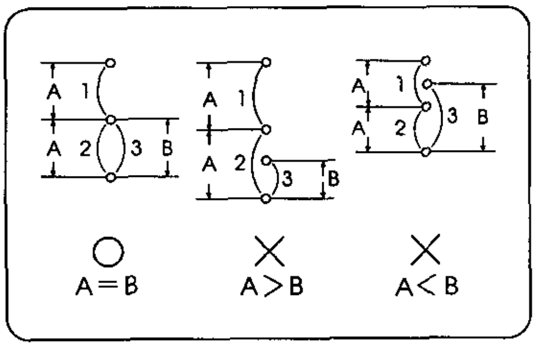
MECHANICAL ADJUSTMENT

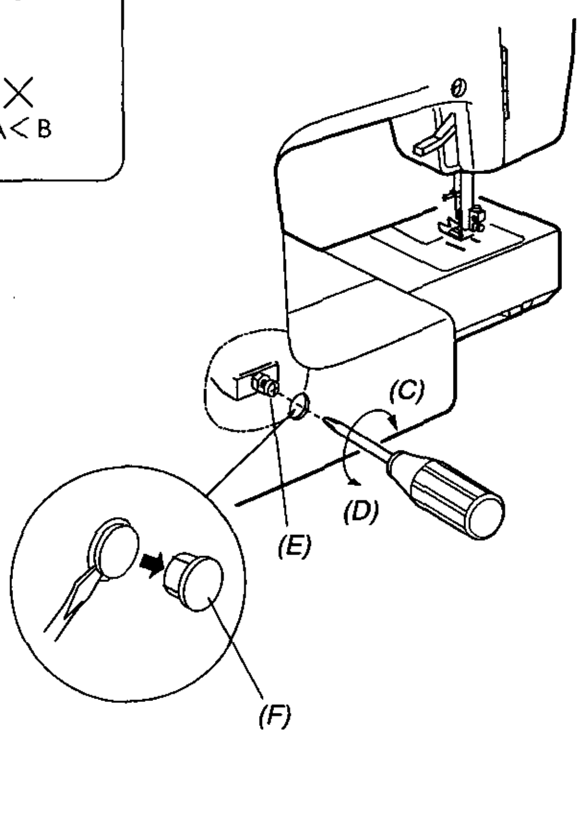
STRETCH STITCH BALANCE

ADJUSTMENT PROCEDURE:

1. REMOVE THE CAP (F).
2. IF THE REVERSE STITCH LENGTH (B) IS SHORTER THAN THE FORWARD STITCH LENGTH (A), TURN THE ADJUSTING SETSCREW (E) IN THE DIRECTION OF (C).

   IF THE REVERSE STITCH LENGTH (B) IS LONGER THAN THE FORWARD STITCH LENGTH (A), TURN THE ADJUSTING SETSCREW (E) IN THE DIRECTION OF (D).





MECHANICAL ADJUSTMENT

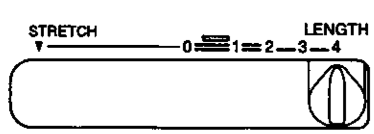
FEED DOG HEIGHT

TO CHECK:

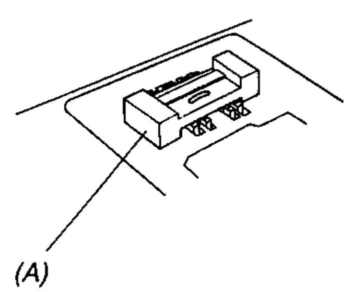
1. SET THE STITCH LENGTH CONTROL AT "4", AND RAISE THE NEEDLE TO ITS HIGHEST POSITION.
2. RAISE THE PRESSER FOOT, AND PLACE THE FEED DOG HEIGHT GAUGE (#68496) ON THE NEEDLE PLATE.
3. TURN THE HANDWHEEL, AND CHECK THE FEED DOG HEIGHT.
4. THE FEED DOG HEIGHT SHOULD BE IN ACCORDANCE WITH CHART 1.

CHART 1

GAUGE		FEED DOG HEIGHT
FACE (A) 0.95MM	FACE (B) 0.75MM	
NOT MOVING	MOVING	CORRECT
NOT MOVING	NOT MOVING	LOW
MOVING	MOVING	HIGH



STITCH LENGTH CONTROL

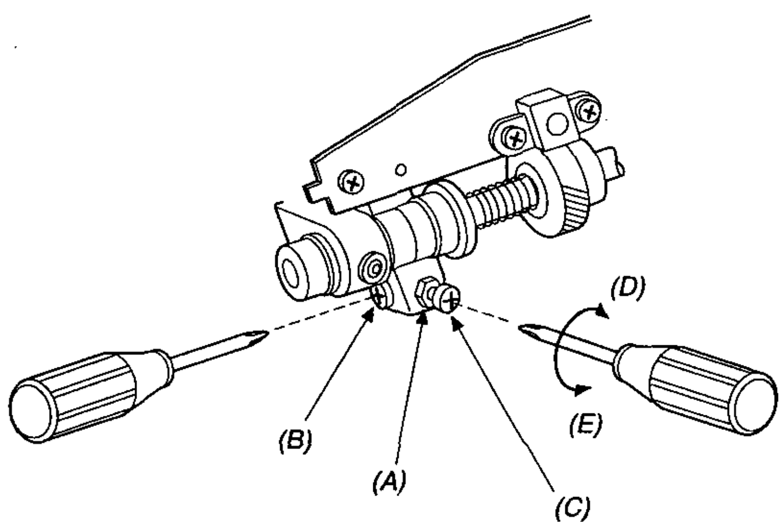


MECHANICAL ADJUSTMENT

FEED DOG HEIGHT

ADJUSTMENT PROCEDURE:

1. REMOVE THE BED COVER.
2. LOOSEN THE NUT (A) AND THE SETSCREW (B).
3. TURN THE ADJUSTING SCREW (C) IN THE DIRECTION OF (D) WHEN THE FEED DOG HEIGHT IS LOW, OR IN THE DIRECTION OF (E) WHEN THE FEED DOG HEIGHT IS HIGH.
4. TIGHTEN THE NUT (A) AND THE SETSCREW (B) SECURELY.



MECHANICAL ADJUSTMENT

NEEDLE BAR HEIGHT

MACHINE SETTING:

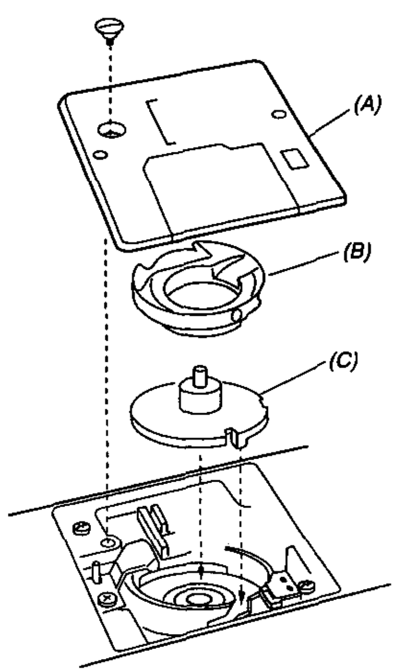
1. SET THE STITCH SELECTOR AT ⊥ , AND THE ZIG ZAG WIDTH AT "6.5."

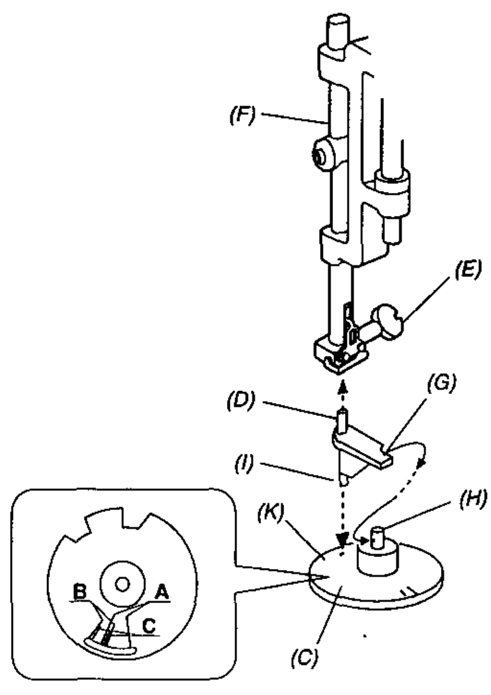
PREPARATION:

1. REMOVE THE NEEDLE, PRESSER FOOT, NEEDLE PLATE (A) AND BOBBIN HOLDER (B).
2. INSERT THE RADIAL TIMING GAUGE #68497 (C) ONTO THE HOOK.
3. LOOSEN THE NEEDLE CLAMP SCREW (E) AND ATTACH THE NEEDLE BAR HEIGHT GAUGE #68168 (D).
   * PUSH IT UP UNTIL IT STOPS.
4. TIGHTEN THE NEEDLE CLAMP SCREW (E).

TO CHECK:

1. TURN THE HANDWHEEL TOWARD YOU UNTIL THE NEEDLE BAR (F) REACHES ITS LOWEST POSITION.
   * IF THE FINGER (G) COMES DOWN ON TOP OF THE PIN (H), OR IF THE PIN (I) TOUCHES THE SURFACE OF THE GAUGE (K) TOO FORCEFULLY, ADJUST IT IN ACCORDANCE THE INSTRUCTIONS ON THE NEXT PAGE.
2. THE FACE OF THE FINGER (G) SHOULD HIT THE SIDE OF PIN (H), AND THE END OF PIN (I) SHOULD TOUCH THE SURFACE OF THE GAUGE (K) WHEN THE NEEDLE BAR (F) REACHES ITS LOWEST POSITION.



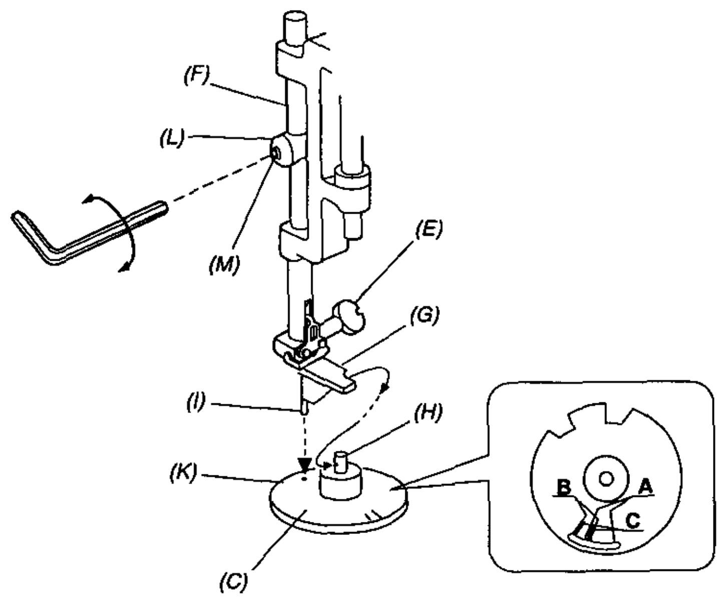


MECHANICAL ADJUSTMENT

NEEDLE BAR HEIGHT

ADJUSTMENT PROCEDURE:

1. OPEN THE FACE COVER.
2. LOOSEN THE HEXAGONAL SOCKET SCREW (M) ON THE NEEDLE BAR HOLDER (L).
3. MOVE THE NEEDLE BAR (F) UP OR DOWN, TO ADJUST THE POSITION OF THE NEEDLE BAR (F) SO THAT THE FACE OF FINGER (G) HITS THE SIDE OF PIN (H), AND THE END OF PIN (I) TOUCHES THE SURFACE OF THE GAUGE (K).
4. TIGHTEN THE HEXAGONAL SOCKET SCREW (M) SECURELY.



MECHANICAL ADJUSTMENT

NEEDLE TO SHUTTLE TIMING

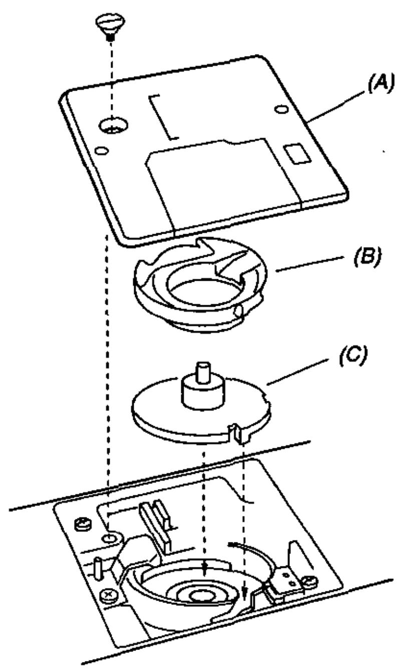
1. SET THE STITCH SELECTOR AT ⏀ , AND THE ZIG ZAG WIDTH AT "6.5."

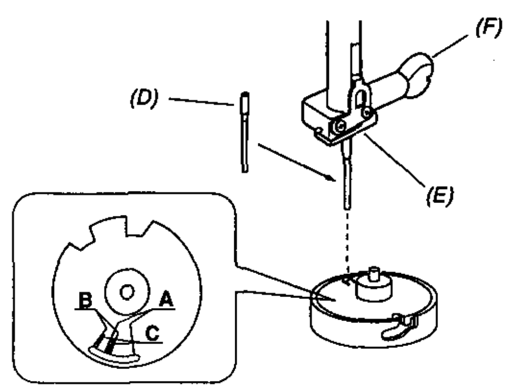
PREPARATION:

1. REMOVE THE NEEDLE, PRESSER FOOT, NEEDLE PLATE (A) AND BOBBIN HOLDER (B).
2. INSERT THE RADIAL TIMING GAUGE #68497 (C) SO THAT THE SMALL FINGER ON THE GAUGE FITS INTO THE SLOT NEAR THE TIP OF THE HOOK.
3. PUT THE TEST PIN #68368 (D) IN TO THE NEEDLE HOLDER (E).
   * PUSH UP IT UNTIL IT STOPS.
4. TIGHTEN THE NEEDLE CLAMP SCREW (F).

TO CHECK:

1. TURN THE HANDWHEEL TOWARD YOU UNTIL THE TIP OF TEST PIN #68368 (D) SLIGHTLY TOUCHES THE RADIAL TIMING GAUGE #68497 (C).
2. THE TIP OF TEST PIN #68368 (D) SHOULD BE BETWEEN THE TWO WHITE LINES OF THE RADIAL TIMING GAUGE #68497 (C).
   * IF THE TEST PIN DOES NOT FALL BETWEEN THE TWO WHITE LINES ON THE RADIAL TIMING GAUGE, ADJUST AS FOLLOWS.



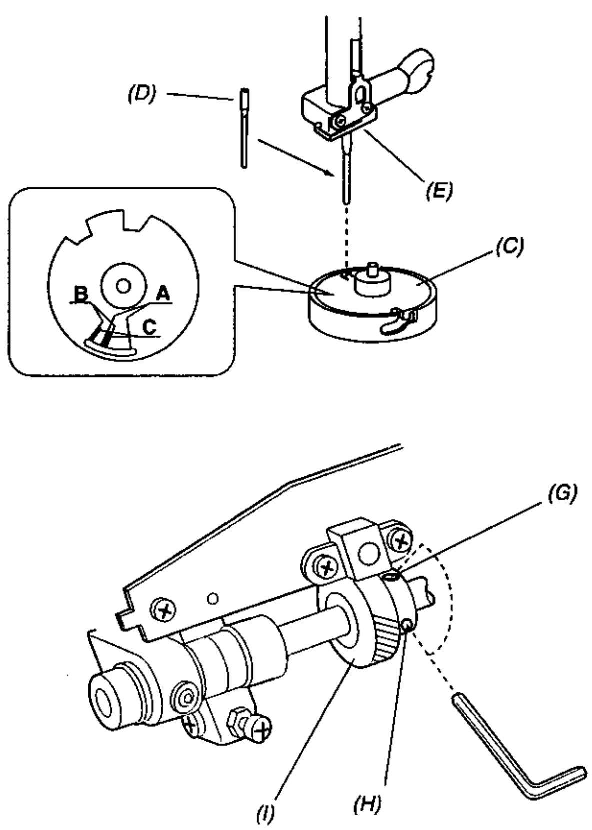


MECHANICAL ADJUSTMENT

NEEDLE TO SHUTTLE TIMING

ADJUSTMENT PROCEDURE:

1. REMOVE THE BED COVER (SEE P.7).
2. TURN THE HANDWHEEL TOWARD YOU UNTIL THE NEEDLE BAR REACHES THE LOWEST POSITION.
3. LOOSEN HEXAGONAL SOCKET SCREWS (G) AND (H).
4. HOLD THE HANDWHEEL, AND TURN THE LOWER SHAFT GEAR (I) UNTIL THE TEST PIN #68368 (D) COMES IN BETWEEN THE TWO WHITE LINES OF THE RADIAL TIMING GAUGE #68497 (C).
5. TIGHTEN HEXAGONAL SOCKET SCREWS (G) AND (H).



MECHANICAL ADJUSTMENT

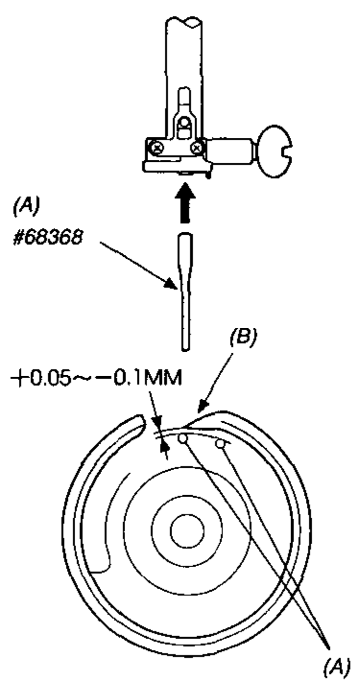
NEEDLE CLEARANCE TO SHUTTLE

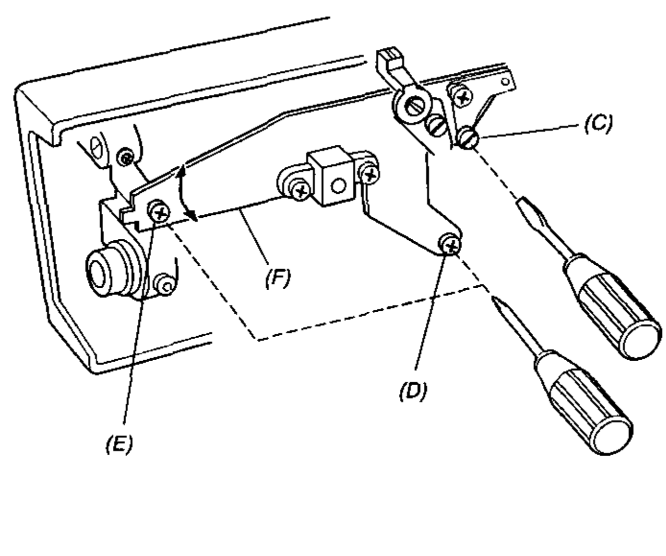
TO CHECK:

1. SET THE STITCH SELECTOR AT ⦚ .
2. REPLACE THE NEEDLE WITH THE TEST PIN #68368 (A).
2. TURN THE HANDWHEEL SLOWLY BY HAND UNTIL THE NEEDLE BAR REACHES ITS LOWEST POSITION.
3. THE CLEARANCE BETWEEN THE TEST PIN (A) AND THE SHARP END (B) OF THE SHUTTLE HOOK SHOULD BE BETWEEN +0.05 (0.002") AND – 0.10 MM (-0.004").

ADJUSTMENT PROCEDURE:

1. REMOVE THE BED COVER (SEE P.7).
2. LOOSEN THE SETSCREWS (C), (D) AND (E).
3. TIGHTEN THE SETSCREW (C) TEMPORARILY.
4. MOVE THE PLATE (F) IN EITHER DIRECTION, AS SHOWN BY THE ARROW UNTIL THE CLEARANCE BETWEEN THE TEST PIN (A) AND THE SHARP END (B) OF THE SHUTTLE HOOK BECOMES BETWEEN +0.05 AND –0.10 MM.
5. TIGHTEN THE SETSCREWS (C), (D) AND (E) SECURELY.





MECHANICAL ADJUSTMENT

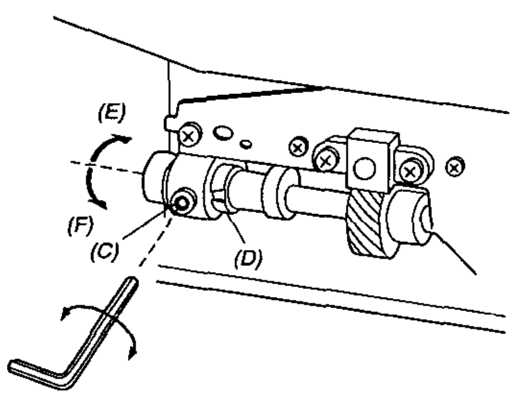
BACKLASH (LOWER SHAFT GEAR)

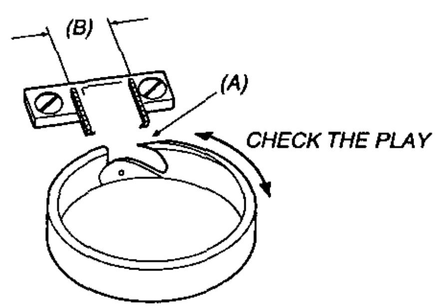
TO CHECK:

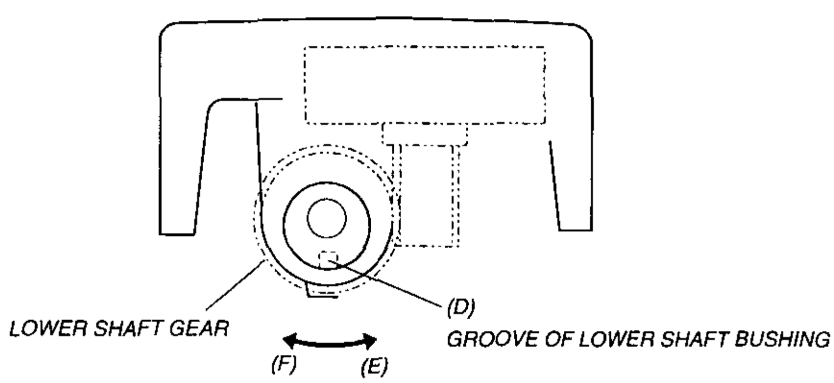
1. REMOVE THE NEEDLE PLATE AND BOBBIN HOLDER.
2. TURN THE HANDWHEEL SLOWLY TOWARD YOU UNTIL THE TIP OF THE SHUTTLE HOOK (A) IS BETWEEN BOTH ENDS (B) OF THE FEED DOG.
3. ROTATE THE HOOK RACE CLOCKWISE AND COUNTER CLOCKWISE BY HAND, AND CHECK THE PLAY. IT SHOULD BE WITHIN 0.8 MM (0.03").
   * IF THERE IS MORE THAN A 0.8 MM (0.03") BACKLASH BETWEEN THE GEARS, ADJUST AS FOLLOWS.

ADJUSTMENT PROCEDURE:

1. REMOVE THE BED COVER (SEE P.7), AND LOOSEN HEXAGONAL SOCKET SCREW (C).
2. TURN THE LOWER SHAFT BUSHING (ECCENTRIC BUSHING) (D) IN DIRECTION (E) WHEN THE PLAY AT THE SHUTTLE HOOK TIP IS TOO SMALL.
3. TURN THE LOWER SHAFT BUSHING (ECCENTRIC BUSHING) (D) IN DIRECTION (F) WHEN THE PLAY AT THE SHUTTLE HOOK TIP IS TOO LARGE.
4. TIGHTEN THE HEXAGONAL SOCKET SCREW (C) SECURELY AFTER ADJUSTMENT.







MECHANICAL ADJUSTMENT

BUTTONHOLE STITCH BALANCE

TO CHECK:

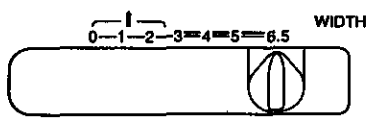
1. SET THE MACHINE AS FOLLOWS:

   STITCH SELECTOR: 

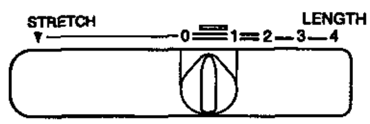
   STITCH LENGTH CONTROL: BLUE ZONE

   STITCH WIDTH CONTROL: 6.5

2. ATTACH THE AUTOMATIC BUTTONHOLE FOOT.
3. SEW A BUTTONHOLE, AND CHECK THE STITCH BALANCE BETWEEN THE RIGHT AND LEFT SIDES OF THE BUTTONHOLE.
4. THE CORRECT BUTTONHOLE STITCH BALANCE IS WHEN THERE IS THE SAME COARSE ON THE RIGHT AND LEFT SIDES OF THE BUTTONHOLE.



STITCH WIDTH CONTROL



STITCH LENGTH CONTROL



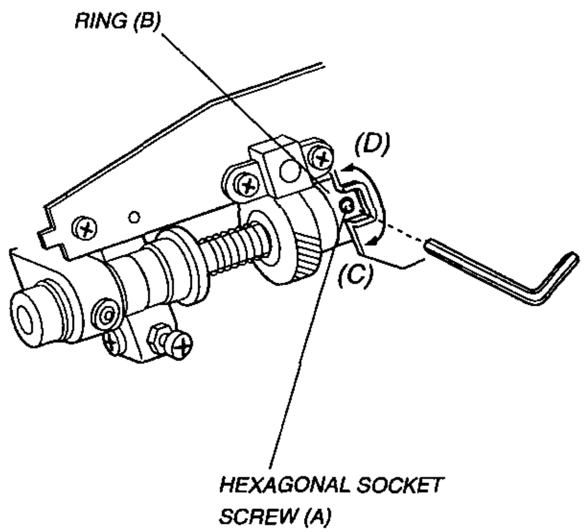
SELECTED PATTERN

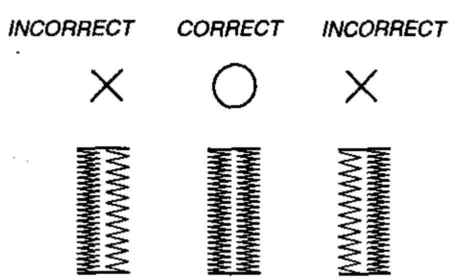
MECHANICAL ADJUSTMENT

BUTTONHOLE STITCH BALANCE

ADJUSTMENT PROCEDURE:

1. REMOVE THE BED COVER. (SEE P.7)
2. LOOSEN HEXAGONAL SOCKET SCREW (A).
3. IF THE RIGHT SIDE OF THE BUTTONHOLE IS TOO SPARSE, TURN THE RING (B) IN THE DIRECTION OF (C).
   IF THE LEFT SIDE OF THE BUTTONHOLE IS TOO SPARSE, TURN THE RING (B) IN THE DIRECTION OF (D).
4. TIGHTEN HEXAGONAL SOCKET SCREW (A) SECURELY.





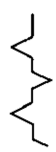
MECHANICAL ADJUSTMENT

NEEDLE POSITION

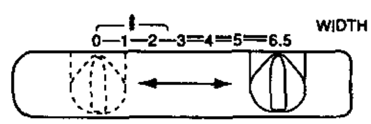
TO CHECK:

1. SET THE MACHINE AS FOLLOWS:
   STITCH SELECTOR: 
   STITCH WIDTH CONTROL: 6.5

2. TURN THE HANDWHEEL TOWARD YOU UNTIL THE NEEDLE COMES TO THE CENTER POSITION.
3. THE NEEDLE SHOULD NOT MOVE WHEN YOU TURN THE STITCH WIDTH CONTROL TO " 0 ".



SELECTED PATTERN



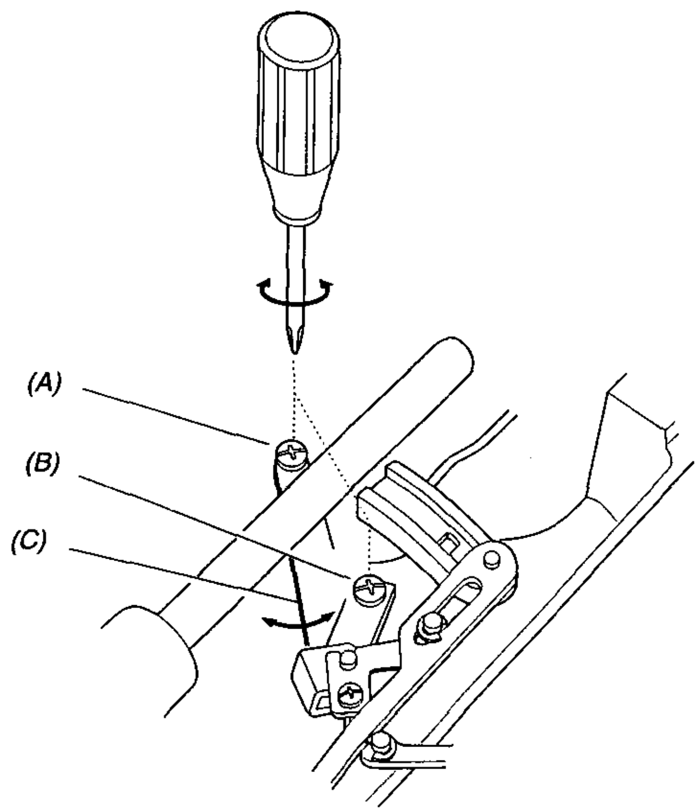
STITCH WIDTH CONTROL

MECHANICAL ADJUSTMENT

NEEDLE POSITION

ADJUSTMENT PROCEDURE:

1. REMOVE THE TOP COVER. (SEE P.6)
2. TURN THE HANDWHEEL TOWARD YOU UNTIL THE NEEDLE COMES TO THE CENTER OF THE SLIT IN THE NEEDLE PLATE.
3. LOOSEN THE SETSCREWS (A) AND (B).
4. TIGHTEN THE SETSCREW (A) SLIGHTLY.
5. MOVE THE PLATE (C) IN EITHER DIRECTION, AS SHOWN BY THE ARROW, UNTIL THE NEEDLE CEASES TO MOVE. (EVEN IF THE DIAL IS MOVED FROM MAXIMUM ZIGZAG WIDTH TO ZERO.)



MECHANICAL ADJUSTMENT

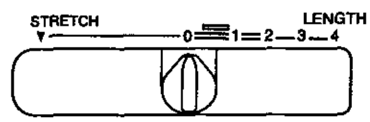
ZERO FEEDING

TO CHECK:

1. SET THE STITCH SELECTOR TO , AND THE STITCH LENGTH CONTROL TO " 0."
2. PLACE A PIECE OF PAPER ON THE NEEDLE PLATE.
3. CHECK IF THE PAPER MOVES FORWARD OR BACKWARD WHEN YOU TURN THE HANDWHEEL TOWARD YOU.
4. THE MACHINE SHOULD NOT FEED A PIECE OF PAPER AT THIS SETTING.



SELECTED PATTERN



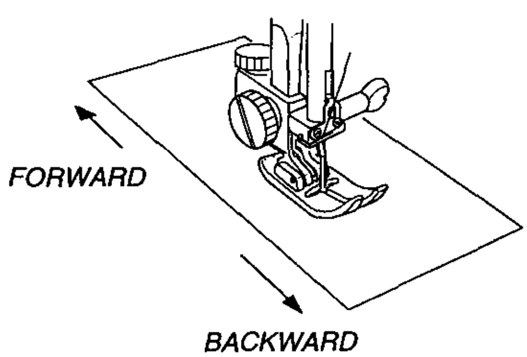
STITCH LENGTH CONTROL

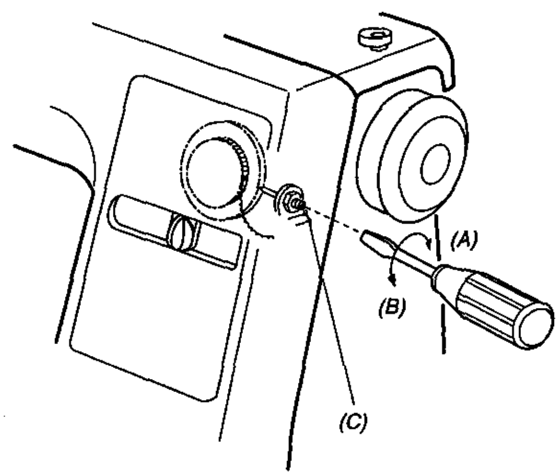
MECHANICAL ADJUSTMENT

ZERO FEEDING

ADJUSTMENT PROCEDURE:

1. REMOVE THE BELT COVER (SEE P.8).
2. SET THE STITCH SELECTOR AT ⫰ , AND THE STITCH LENGTH CONTROL AT " 0 ".
3. PLACE A PIECE OF PAPER ON THE NEEDLE PLATE.
4. IF THE PAPER MOVES FORWARD, TURN THE ADJUSTING SCREW (C) IN DIRECTION (A).
   IF THE PAPER MOVES BACKWARD, TURN THE ADJUSTING SCREW (C) IN DIRECTION (B).





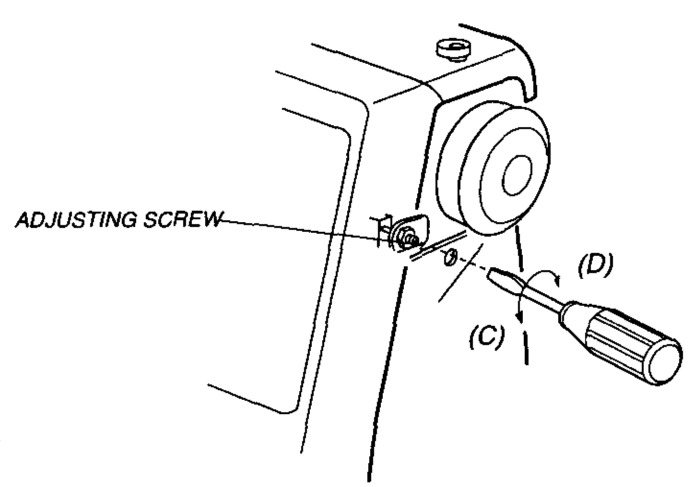
MECHANICAL ADJUSTMENT

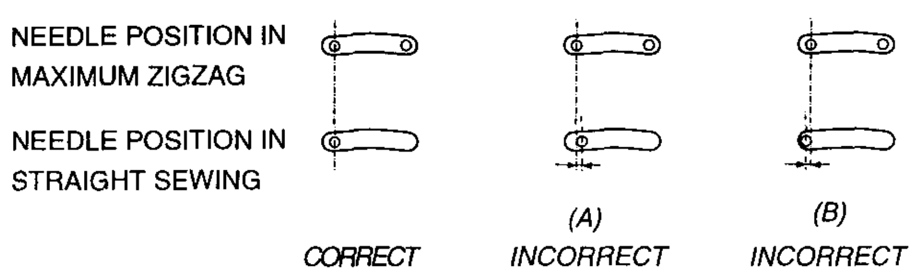
BASIC NEEDLE POSITION

* IF THE LEFT NEEDLE POSITION IN MAXIMUM ZIGZAG AND IN STRAIGHT SEWING ARE NOT THE SAME, ADJUST AS FOLLOWS:

ADJUSTMENT PROCEDURE:

1. REMOVE THE BELT COVER (SEE P.8).
2. SELECT THE LEFT NEEDLE POSITION IN MAXIMUM ZIG ZAG, THEN SELECT THE LEFT NEEDLE POSITION IN STRAIGHT SEWING.
3. IF THE RESULT LOOKS LIKE (A) SEE BELOW, TURN THE ADJUSTING SCREW IN DIRECTION (D).
   IF THE RESULT LOOKS LIKE (B) SEE BELOW, TURN THE ADJUSTING SCREW IN DIRECTION (C).
4. REPLACE THE BELT COVER (SEE P.8).





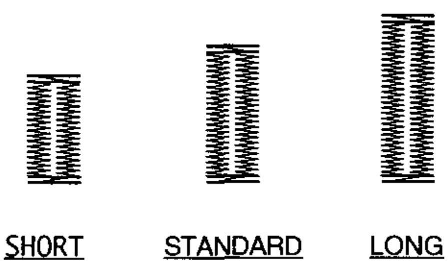
MECHANICAL ADJUSTMENT

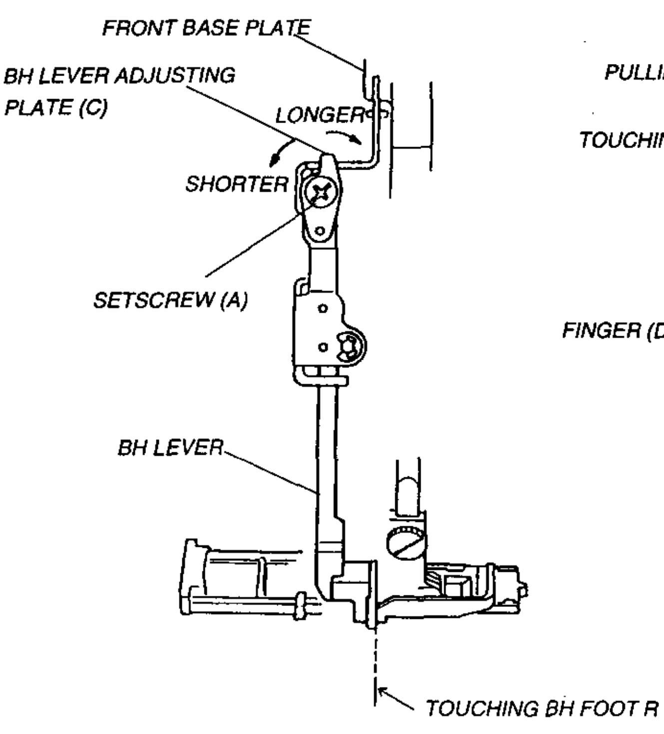
BUTTONHOLE FUNCTION (1)

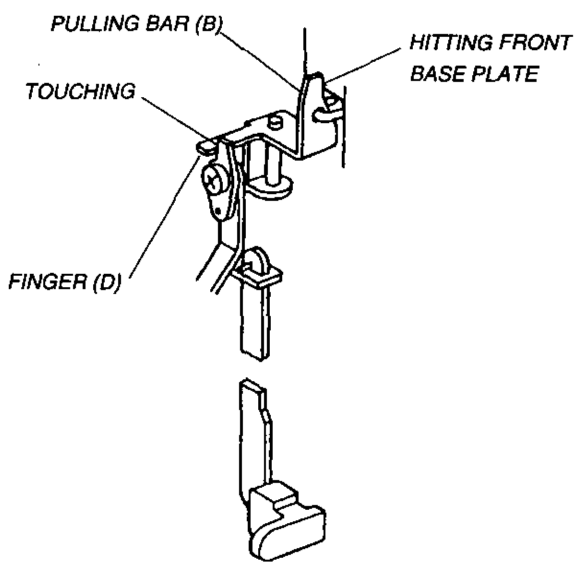
* A BUTTONHOLE THAT HAS BEEN SEWN WITH THE AUTOMATIC BUTTONHOLE FOOT WILL BE 3 MM (0.12") LONGER THAN THE ACTUAL BUTTON. THIS LENGTH CAN BE ADJUSTED AS FOLLOWS:

ADJUSTMENT PROCEDURE:

1. LOWER THE FEED DOG AND ATTACH THE BH FOOT "**R**", THEN LOWER THE PRESSER BAR.
2. LOOSEN THE SETSCREW (A).
3. PULL DOWN THE BH LEVER UNTIL IT TOUCHES FOOT "**R**", AND THE BAR (B) HITS THE FRONT BASE PLATE. ALSO, MAKE SURE THE BH LEVER ADJUSTING PLATE (C) TOUCHES THE FINGER (D). TIGHTEN THE SETSCREW (A).
4. RAISE THE FEED DOG, AND SEW A BUTTONHOLE. THEN, CHECK THE LENGTH.







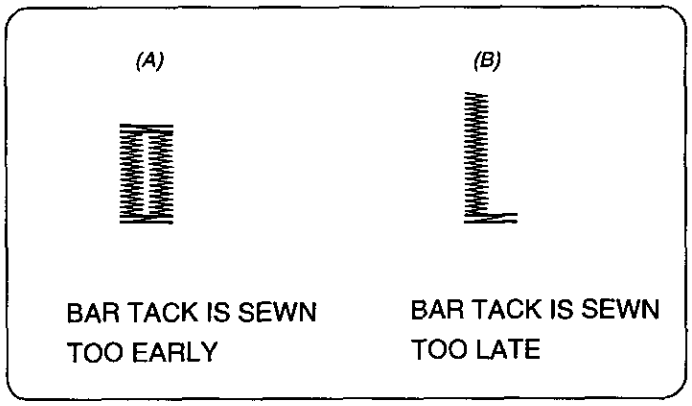
MECHANICAL ADJUSTMENT

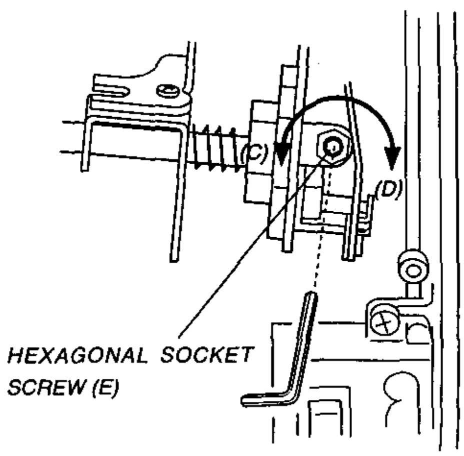
BUTTONHOLE FUNCTION (2)

* IF THE BAR TACK ON THE BUTTONHOLE OCCURS TOO EARLY, OR IF NO BAR TACK IS SEWN AT ALL, ADJUST AS FOLLOWS.

ADJUSTMENT PROCEDURE:

1. REMOVE THE BELT COVER (SEE P.8).
2. (A) IF THE BAR TACK IS SEWN TOO EARLY, TURN THE HEXAGONAL SOCKET SCREW (E) IN DIRECTION (C).
   (B) IF THE BAR TACK IS SEWN TOO LATE, TURN THE HEXAGONAL SOCKET SCREW (E) IN DIRECTION (D).
3. ATTACH THE BELT COVER (SEE P.8).





MECHANICAL ADJUSTMENT

REPLACEMENT AND ADJUSTMENT OF NEEDLE THREADER PLATE

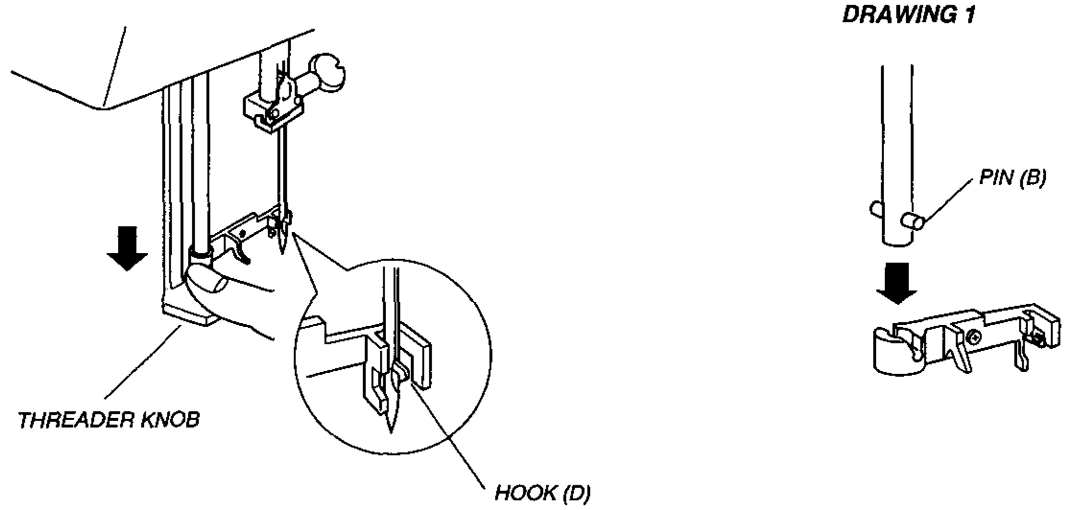
IF THE NEEDLE THREADER IS DAMAGED, REPLACE IT OR ADJUST AS FOLLOWS TO REPLACE THE NEEDLE THREADER COVER:

1. PULL OUT THE THREADER COVER (DRAWING. 1).
2. TO ATTACH THE THREADER COVER, MATCH THE GROOVE TO THE PIN (B) AND INSERT THE THREADER COVER (C).

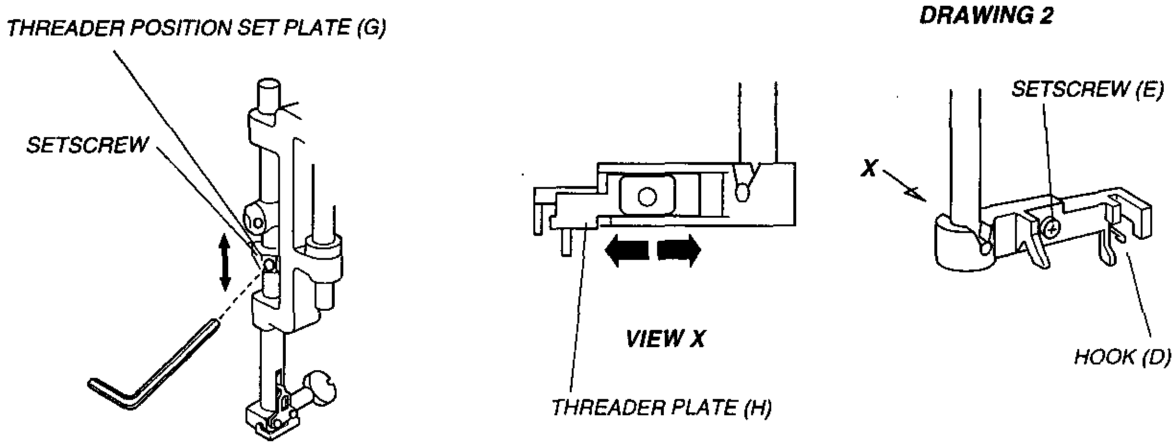
ADJUSTMENT OF THREADER PLATE:

3. IF THE HOOK (D) IS TOUCHING THE RIGHT OR LEFT SIDE OF NEEDLE EYE, LOOSEN THE SETSCREW (E) AND SLIDE THE THREADER PLATE (H). (SEE DRAWING 2)
4. IF THE HOOK (D) IS TOUCHING THE TOP OR BOTTOM SIDE OF NEEDLE EYE, REMOVE THE FACE COVER AND LOOSEN THE SETSCREW (F) AND ADJUST THE THREADER POSITION SET PLATE (G).

DRAWING 1



DRAWING 2



MECHANICAL ADJUSTMENT

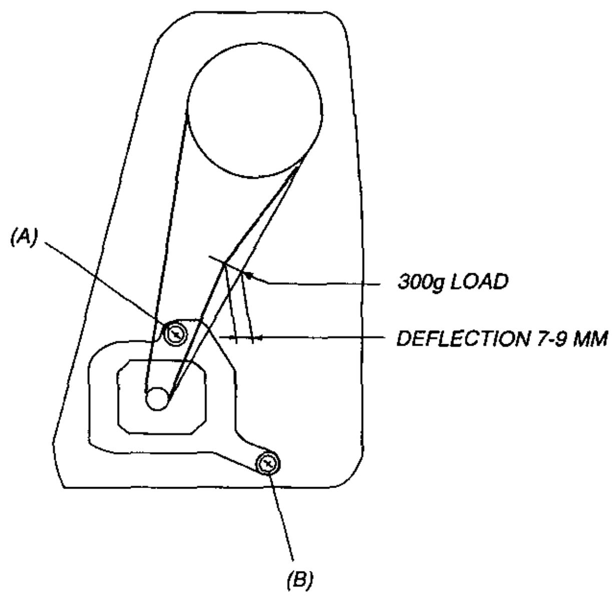
MOTOR BELT TENSION

TO CHECK:

1. IF THE MOTOR BELT TENSION IS TOO TIGHT OR TOO LOOSE, IT MAY CAUSE THE BELT TO MAKE NOISE.
   A TOO TIGHT MOTOR BELT TENSION CAN CAUSE THE MACHINE TO RUN SLOWLY AND WILL OVERLOAD THE MOTOR; A TOO LOOSE MOTOR BELT TENSION, MAY CAUSE THE BELT TEETH TO JUMP OVER THE PULLEY.
2. THE CORRECT MOTOR BELT TENSION IS ACHIEVED WHEN THE BELT IS PUSHED IN ABOUT 7 MM (0.28") - 9 MM (0.36") UNDER A PRESSURE OF ABOUT 300 GRAMS.

ADJUSTMENT PROCEDURE:

1. REMOVE THE BELT COVER (SEE P.8).
2. LOOSEN THE SETSCREWS (A) AND (B).
3. MOVE THE MOTOR UP OR DOWN TO ADJUST THE DEFLECTION TO ABOUT 7 MM (0.28") - 9MM (0.36").
4. TIGHTEN THE SETSCREWS (A) AND (B).



OILING

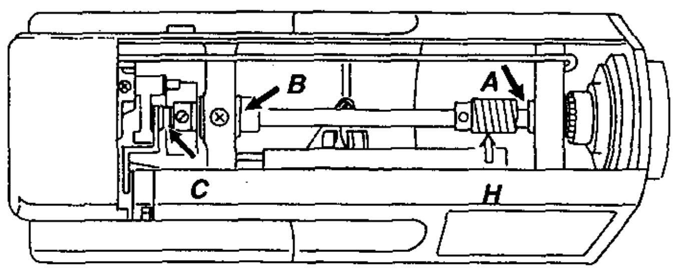
FACTORY LUBRICATED PARTS WILL PROVIDE YEARS OF HOUSEHOLD SEWING WITHOUT ROUTINE OILING, BUT YOU SHOULD STILL CHECK FOR POSSIBLE LUBRICATION NEEDS WHENEVER SERVICING THE MACHINES.

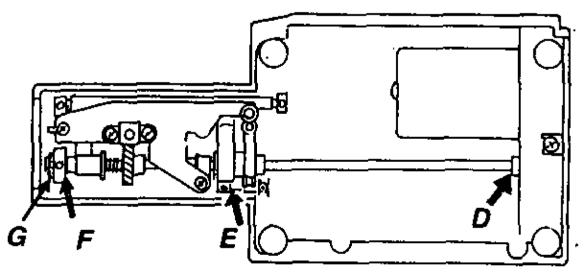
OIL:

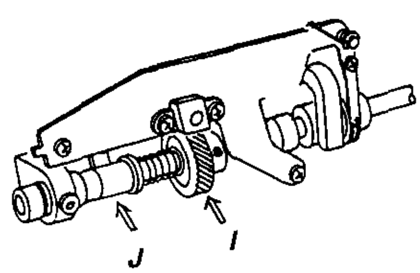
USE GOOD QUALITY SEWING MACHINE OIL AT THE POINTS (A, B, C, D, E, F & G) INDICATED BY THE BLACK ARROWS.

GREASE:

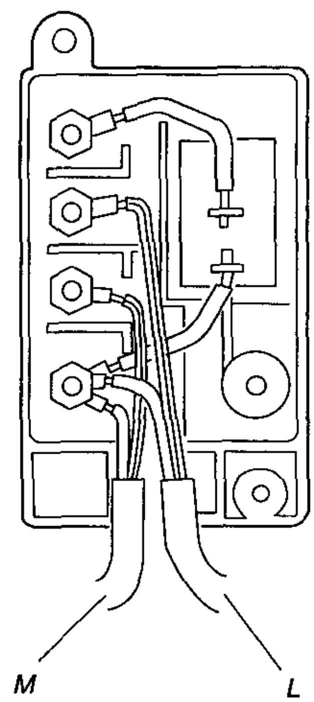
USE WHITE GREASE SUCH AS MOLYCOTE EM-40M AT THE POINTS (H, I, & J) INDICATED BY THE WHITE ARROWS.







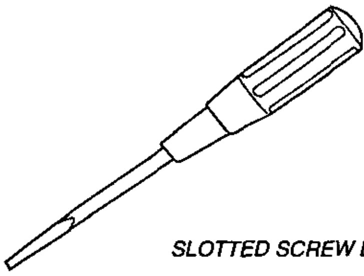
WIRING OF TERMINAL BLOCK



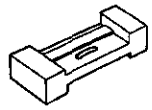
L : LAMP

M : MOTOR

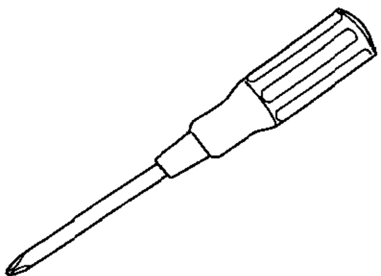
SPECIAL TOOLS REQUIRED



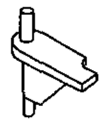
SLOTTED SCREW DRIVER



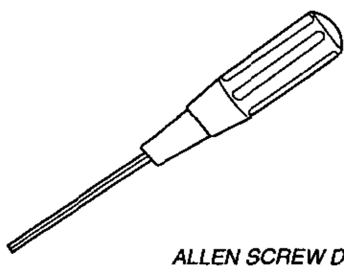
FEED DOG HEIGHT GAUGE #68496



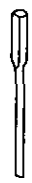
PHILLIPS SCREW DRIVER



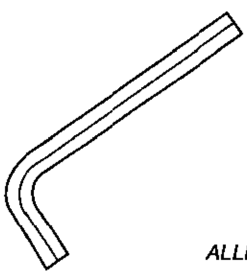
NEEDLE HEIGHT GAUGE #68168



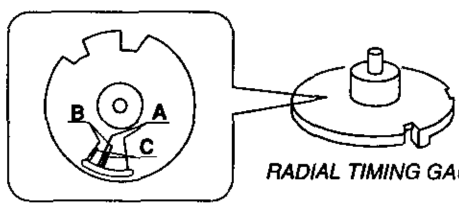
ALLEN SCREW DRIVER



TEST PIN #68368



ALLEN WRENCH



RADIAL TIMING GAUGE #68497

RADIAL TIMING GAUGE SHEET
#U1369C